DOCUMENT RESUME

ED 386 388 SE 056 778

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TITLE UNEP: Two Decades of Achievement and Challenge. 20 Years.
INSTITUTION United Nations Environment Programme, Nairobi (Kenya).
REPORT NO ISBN-92-807-1359-0
PUB DATE 92
NOTE 57p.; Color photographs may not reproduce well.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Environmental Education; Global Education; *International Programs; *Program Descriptions
IDENTIFIERS Environmental Education Programs; Environmental Problems; *United Nations Environment Program

ABSTRACT

This publication highlights major achievements of the United Nations Environment Program (UNEP) activities over the period 1970 to 1990. Chapter 1, "The Stockholm Conference and the Establishment of UNEP," describes the establishment of UNEP. Chapter 2, "The Role of UNEP," covers program development, environment and development, and UNEP's priorities. Chapter 3, "Two Decades of Achievements," highlights problems and programs in the areas of protection of the atmosphere, management of freshwater resources, protection of oceans and coastal areas, protection of land resources, conservation of biological diversity, management of toxic chemicals and hazardous wastes, development and quality of life, environmental monitoring, and other program activities (including environmental law, environmental education and training, public awareness, and UNEP's Clearinghouse). Each resource topic contains an introduction to the global environmental problem and an "Action" section that describes UNEP programs addressing the problems. Chapter 4, "Priorities for the Future," outlines UNEP priorities for the next decade in environmental management, environmental assessment, and support measures. (LZ)

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UNEP
Two Decades of Achievement and Challenge

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In 1992, the United Nations Environment Programme organized a worldwide photographic competition to draw attention to the state of the world's environment with the theme "Focus on Your World". The competition, sponsored by Canon Inc., attracted over 32,000 photographs from 13,000 entrants in 144 countries. All the photographs in this publication were entries in the competition.

An exhibition of photographs from the competition is touring major cities around the world and ***Your World****, a book containing over 200 images, is published by Harvill/HarperCollins.*

UNEP
Two Decades of Achievement and Challenge

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PREFACE

The environmental threats facing the world are so great and so universal that no country, or group of countries, can hope to tackle them alone. They compel us to act together as a world community. They require us to forge a global partnership.

We now realize that unless development is guided by environmental, social, cultural and ethical considerations, much of it will continue to have undesired effects, to provide reduced benefits or even fail altogether. Such unsustainable development will only exacerbate the environmental problems that already exist. We also realize now that the lack of adequate development creates serious environmental problems. The relentless pressures that arise where basic human needs are not met can erase the resource base from which man must inevitably gain his sustenance. The destruction of forests, the loss of arable soil, the loss of productivity through disease and malnutrition and the increasing pressure on fragile ecosystems which so often result from poverty are as significant as the pollution created by industry, technology and over-consumption by the affluent.

Ever since it was created, as a result of the United Nations Conference on the Human Environment convened in Stockholm in 1972, UNEP has recognized that the environment and economic development are closely linked. So UNEP actively promotes environmentally-sound development – development which maintains and improves economic progress without damaging the environment and natural resource bases upon which future development depends.

UNEP is dedicated to bridging the gap between awareness and action. It has worked closely with other members of the UN system and forged new relationships among scientists and decision-makers, industrialists and environmental activists on behalf of the environment. It seeks the balance between national interests and the global good, aiming to unite nations to confront common environmental problems. Unique among United Nations bodies, it exists as a catalyst, spurring others to act and working through and with other organizations, including UN agencies and governments, and only sometimes sharing the credit for the achievements.

The achievements are heartening, as this booklet reveals. The following pages are not intended to give an encyclopaedic list of UNEP activities over the last two decades of its history, but to highlight major achievements over that period. A gigantic task looms ahead. All of us who work for UNEP will not manage alone. We count on your help in these efforts.

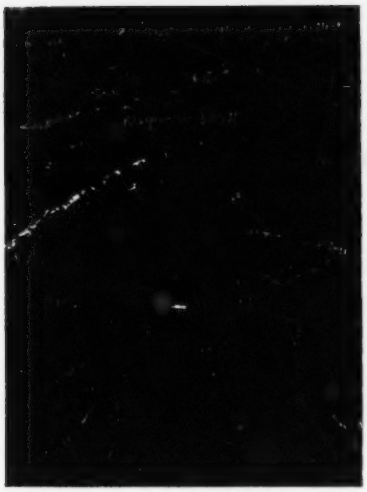
MOSTAFA K. TOLBA

Executive Director

United Nations Environment Programme

Nairobi, October 1992

THE STOCKHOLM CONFERENCE AND THE ESTABLISHMENT OF UNEP



In their quest for survival and development, human beings have had a radical impact on the environment – the physical and biological system within which they and other organisms live. By increasing the output of food, fibre, fuel and other useful products, these changes have often been crucial to the growth, security and quality of life of our species.

But human activities have also damaged the environment. As a result soil erodes, cropland and forests disappear, species die out, pollution spreads – and millions of people suffer. Meanwhile climatic change, desertification, deteriorating water supplies and the disruption of biological diversity threaten the very future of humanity.

During ancient times, people learned that their actions could undermine the natural resources on which they depended. Therefore, some early civilizations created reserves to protect wildlife or natural areas. Historical records show that religious taboos and sanctions protected some species of animals and some forest groves and plants. Practices were developed to maintain the fertility of the soil and prevent erosion.

Technological advance in the first half of the 20th century raised fundamental questions about whether the globe could continue to support its rapidly growing population – and about whether the technology itself was appropriate. These questions were first debated in scientific circles, but soon caught the attention of the public. By the late 1960s, environmentalism had turned from concentrating on the natural environment alone to looking at its interrelation with human beings. Before long, environmental issues began to appear on the political agenda.

In 1968, Sweden proposed that the United Nations should convene a conference through which the problems of the human environment could be addressed. Its aim was to focus the attention of governments and peoples on the importance and urgency of the issues and to identify the places where international cooperation and agreement were needed. The General Assembly of the United Nations endorsed the proposal and the conference was convened in Stockholm from 5 to 16 June 1972.

The information amassed between 1968 and 1972, in preparation for the conference, vastly expanded our understanding of global environmental problems and of the links between environment and development. This was reflected in the results of the conference: the 26 principles for guiding national and international action and the 109 specific recommendations of the Action Plan for the Human Environment. This plan provided a coherent framework for environmental preservation and enhancement. Its recommendations were a clear breakthrough, representing the most

advanced understanding of environmental problems to date.

Delegates to the Stockholm Conference felt that the existing machinery was not adequate for the task in hand. So they called for permanent institutional and financial arrangements to catalyze, stimulate and coordinate a programme of action for the protection and improvement of the human environment.

The setting-up of UNEP

Even before the Stockholm Conference, several major UN agencies had well-established environmental activities. The idea behind the Environment Programme of the UN – made up of the recommendations in the Action Plan agreed at Stockholm – was to draw together and strengthen these activities, throughout the UN system.

To service and coordinate the programme, the Stockholm Conference recommended a number of institutional measures, which were endorsed by the UN General Assembly in December 1972. In resolution 2997, it decided to establish four new entities.

The first, the Governing Council of the United Nations Environment Programme, was to be composed of 58 nations, elected by the General Assembly for three-year terms, and to act as the UN's intergovernmental organ for environment. Among other functions, it was to promote international cooperation, provide general policy guidance for programmes within the UN system and keep both the world situation and the implementation of UN programmes under review.

The second, a small secretariat based in Nairobi, was to provide a focal point for environmental action and coordination within the UN system, with the aim of ensuring effective management.

The third, a voluntary Environment Fund, was set up to finance new environmental initiatives in whole or in part. These initiatives were to include those suggested by the Stockholm Action Plan, particularly integrated projects, and other activities agreed by the Governing Council.

Finally, the General Assembly established the Environment Coordination Board (ECB), to ensure cooperation and coordination among all UN bodies involved in environmental programmes. The ECB was to be chaired by the Executive Director of the United Nations Environment Programme and was established under the auspices of the UN's Administrative Committee on Coordination and within its framework.

The United Nations Environment Programme, therefore, is not an institution, but a programme which comprises all the activities undertaken within the United Nations system that relate to the environment. The secretariat in Nairobi services and coordinates that programme. As the General Assembly resolution did not name it, it became known simply as 'UNEP'.

THE ROLE OF UNEP

UNEP was set up to catalyze, coordinate and stimulate action within the UN system, not to execute or to finance it.

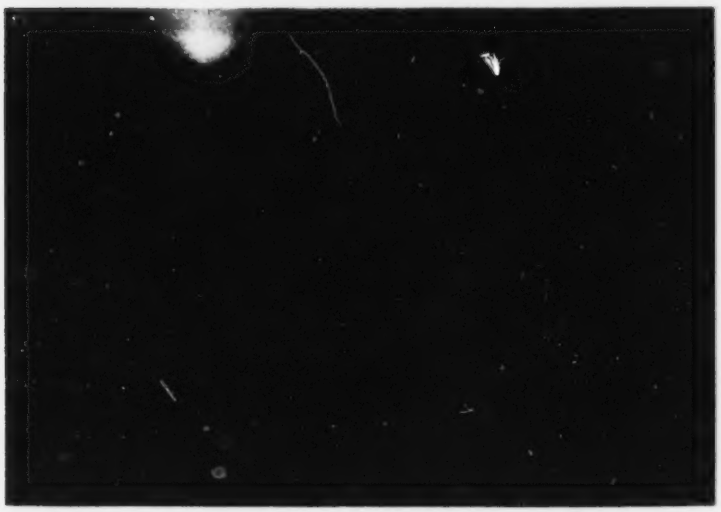
Unlike other specialized agencies such as the Food and Agriculture Organization (FAO) and the World Health Organization (WHO), UNEP does not bear the prime responsibility within the UN system for executing projects in its area of concern. Nor, like the United Nations Development Programme (UNDP), does it exist to fund them. Although UNEP runs some projects of its own and uses some of the Environment Fund to support the environmental activities of others, its primary role lies elsewhere.

When the Governing Council first met in 1973, it outlined UNEP's objectives as follows:

1. To provide, through interdisciplinary study of natural and man-made ecological systems, improved knowledge for an integrated and rational management of the resources of the biosphere, and for safeguarding human well-being as well as ecosystems;

2. To encourage and support an integrated approach to the planning and management of development, including that of natural resources, so as to take account of environmental consequences, to achieve maximum social, economic and environmental benefits;

3. To assist all countries, especially developing countries, to deal with their environmental problems and to help mobilize additional financial resources for the purpose of providing the required technical assistance, education, training and free flow of information and exchange of experience, with a view to promoting the full participation of developing countries in the national and international efforts for the preservation and enhancement of the environment.



UNEP pursues these goals with a multitude of different partners. Although its central task lies within the UN system, it also works with and through intergovernmental and non-governmental organizations and with the scientific community, through research centres and institutes in many countries.

Nearly everything UNEP does falls under the headings of catalysis, coordination or stimulation. Even in its direct activities, it seeks the cooperation of others. In 1984, it launched its Outreach programme, aimed at encouraging groups not directly concerned with the environment to factor it into their activities. Examples include the World Industry Conference convened in cooperation with the International Chamber of Commerce, the Interparliamentary Conference on Environment convened in cooperation with the Interparliamentary Union and cooperation with religious, women's and youth groups.

The General Assembly knew what it was doing when it set up UNEP: the demands of the environment are so vast and so complex that no one secretariat or fund could cope with them on its own. UNEP's approach has paid dividends. It has been estimated that each dollar that the Environment Fund spends on an environmental activity generates another four dollars from supporting organizations, cooperating agencies and governments.

Programme development

The 109 recommendations agreed at Stockholm, though only a summary of the world's environmental problems, represented a formidable list of areas of concern and suggested actions. The UN General Assembly gave UNEP's Governing Council the task of selecting priorities for action.

During its early sessions, the Governing Council took the broad programme developed at Stockholm and brought it into sharper focus, deciding on objectives, strategies and areas of concentration proposed by the Executive Director. The plan's recommendations fell into three categories: environmental assessment (dubbed 'Earthwatch'), environmental management and supporting measures. These constitute the UNEP Triangle.

As priorities, the Governing Council pointed to human settlements, habitat, health and well-being; land, water and desertification; trade, economics and the transfer of technology; oceans; the conservation of nature, wildlife and genetic resources; and energy. These priorities have been adjusted over the years as new knowledge and new areas of concern have emerged.

In its early years, UNEP developed three steps for defining priorities, known as the programmatic approach. First, UNEP gathered information on specific environmental problems and what was being done about them, in order to identify gaps. It presented its findings to the Governing Council in a 'state-of-the-art' report. Each year the Council chose the subjects for next year's report.

Next, in the light of any gaps discovered, UNEP set out objectives, strategies and specific actions, presenting a programme to governments, international and non-governmental organizations, intergovernmental bodies and all others concerned. Finally, some areas of this programme were selected for support by UNEP and the Environment Fund. These activities were chosen for their catalytic and coordinating potential.

At first UNEP gathered and evaluated its information through bilateral 'joint-programming' consultations with each organization involved. Later it adopted a thematic, multilateral approach, bringing together groups of

officials from several organizations concerned with a particular theme, such as education or terrestrial ecosystems.

The next step was to produce an environment programme for the whole UN system. This programme, linked to the UN's medium-term plans, eventually became known as SWMTEP (the system-wide medium-term environment programme). The first SWMTEP, for 1984-89, was approved by the Governing Council in 1982; the second, for 1990-95, in 1988.

The plan is coordinated through two bodies – the UN's Administrative Committee on Coordination, which in 1977 took over the functions of the Environment Coordination Board, and a committee of those responsible for environmental issues within each UN body (the Designated Officials for Environmental Matters), set up by the Executive Director in 1979.

Today, SWMTEP is the main means of harmonizing the UN's environmental activities. Among other things, it aims to:

1. Advance understanding of sustainable development and the means of achieving it, as well as understanding of environmental problems that can hamper the achievement of sustainable development and the ways of solving or alleviating them;

2. Help define and establish the complementarity of the environmental goals and policies of the United Nations system and its components;

3. Present an overall strategy and set up a planning framework for the use of the Environment Fund and for the environmental activities of all components of the United Nations system;

4. Help define roles and working relationships among components of the system and facilitate the coordination of their environmental activities;

5. Identify opportunities for increasing efficiency and effectiveness;

6. Enable monitoring and evaluation of the activities of the system and thereby contribute to their continuing improvement.

Environment and development

From its earliest days, UNEP has stressed the link between environment and development. At Stockholm, poverty was seen as a major source of pollution. The first session of the Governing Council in 1973 decided that UNEP's priorities must integrate the demands of both development and the environment.

In Cocoyoc, Mexico, in October 1974, a symposium sponsored by the UN Conference on Trade and Development (UNCTAD) and UNEP considered the patterns of consumption within and between developed and developing countries and put forward the concept of 'ecodevelopment'. In November 1974, UNEP's statement to the World Food Conference spoke of 'development without destruction' and pointed out that any strategy to increase food production must take account of the need to preserve its ecological base. In 1976, the Governing Council stressed the relevance of ecodevelopment in planning for development and for long-term sustainable use of resources.

During 1979 and 1980, UNEP organized a series of seminars on alternative patterns for development and lifestyles, in cooperation with the Regional Economic Commissions. These seminars concluded that 'humankind is a part of the biophysical world, acts upon it and is affected by its reactions. The biophysical world is the life-support system of society

and provides space, a flow of materials and energy, and a medium for the reabsorption of wastes. These functions of the environment, adequately understood and widely managed, constitute a basis for the achievement of the goals of development.'

UNEP's recommendations were taken into account in the framing of the New International Development Strategy for the Third UN Development Decade, adopted by the General Assembly in December 1980. Over the next decade, these concepts were increasingly stressed. They provided the core of the 'sustainable development' urged in two reports published in 1987: *Our Common Future*, the report of the World Commission on Environment and Development set up on the recommendation of the Governing Council in 1982, and the *Environmental Perspective to the Year 2000 and Beyond*, prepared by the Governing Council itself.

The *Environmental Perspective* recognized that environmental resources are the lifeblood of socio-economic development and that the state of the environment is a vital aspect of human well-being everywhere. It examined the relationship between environment and development, set out goals for environmentally-sound and sustainable development and called for specific action to achieve them. It urged anticipation and prevention, integrating environmental considerations in all development actions. And it advocated greater coordination between different sectors within nations (such as industry, agriculture, energy and health) and between governments.

There is now growing acceptance that the aim of everything done under the United Nations Environment Programme is development which is environmentally sound.

UNEP's priorities

Because of its small size and limited resources from the Environment Fund, the secretariat of the United Nations Environment Programme has had to select priorities for its own work, too. In 1977, the Governing Council set 21 goals for UNEP to achieve by 1982, the end of its first decade. These were reviewed in 1980.

In 1982, the Governing Council held a special session to examine progress over the decade since the Stockholm Conference. It outlined major environmental trends, potential problems and priorities for action for the United Nations system during the next decade. It also outlined UNEP's basic orientation up to 1992.

The Governing Council's Nairobi Declaration of 1982 urged 'all governments and peoples of the world to discharge their historical responsibility, collectively and individually, to ensure that our small planet is passed over to future generations in a condition which guarantees a life in human dignity for all'. It reaffirmed the world community's commitment to the Stockholm Declaration and Plan, to international and national environmental action and to UNEP itself, and called for greater financial resources to be made available, particularly through the Environment Fund.

This, and the two reports published in 1987, encouraged UNEP to focus more on specific issues. In 1989, the Governing Council approved eight areas of concentration for UNEP's work: the protection of the atmosphere, of freshwater quality, of oceans and coastal areas and of land resources, by combating deforestation and desertification; the conservation of biological diversity; the environmentally-sound management of biotechnology and of hazardous wastes and toxic chemicals; and the protection of human health and quality of life.

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Protection of the atmosphere

THE OZONE LAYER

The ozone layer, the fragile shield of gas which protects the Earth from the harmful rays of the sun, is being damaged by chemicals released on the Earth.

This carries serious risks for mankind. The ozone layer blocks out most of the sun's UV-B radiation – which causes skin cancer and cataracts in people, stunts plants, including food crops, and kills the tiny organisms which form the base of the marine food chain.

The main chemicals involved in depleting stratospheric ozone are chlorofluorocarbons (CFCs), used in refrigeration, aerosols and as cleaners in many industries, and halons used in fire extinguishers. The damage is caused when these chemicals release highly reactive forms of chlorine and bromine. In a complex chain of reactions, a single atom of chlorine can destroy up to 100,000 molecules of ozone.

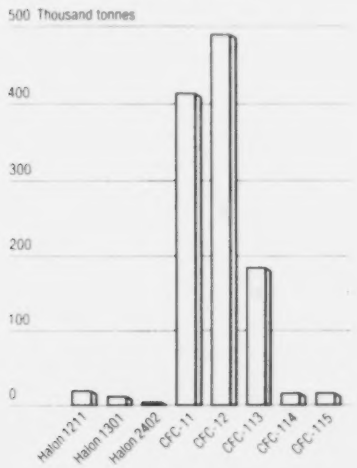
The first evidence of damage came in the early 1980s, when scientists discovered a vast hole in the ozone layer above the Antarctic. Ozone-monitoring stations in Antarctica have detected average losses of 30-40 per cent in the total ozone over the region during the spring; at some altitudes the loss may be as high as 95 per cent.

Recent NASA satellite data indicate that total-column ozone has been decreasing at an average of some 0.26 per cent per year from the Arctic Circle to the Antarctic Circle. North of 35°N (about the latitude of Memphis, Crete and Kyoto) springtime ozone depletions of 3-5 per cent are indicated. In winter, depletion at 45°N (Ottawa and Belgrade) may reach 9 per cent.

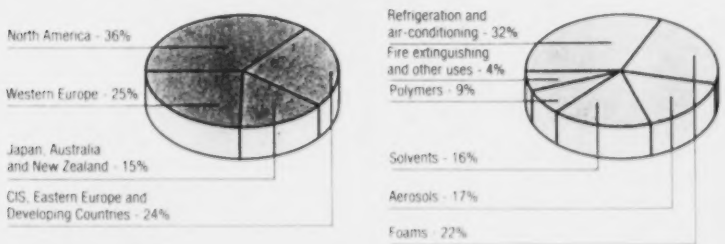
Scientists estimate that if CFCs continue to be emitted as freely as they were in 1980, the ozone layer could be reduced by about 3 per cent over the next 70 years; if emissions double, up to 12 per cent could disappear.

Each 1 per cent reduction in ozone is likely to raise UV-B radiation by about 2 per cent. Worldwide, this could lead to 100,000 more people going blind every year and 50,000 extra cases of non-melanoma skin cancer. Incidence of the most deadly form of skin cancer, melanoma, may also rise.

ESTIMATED WORLD CONSUMPTION OF MAIN CFCs AND HALONS (1986)



ESTIMATED USE OF OZONE-DEPLETING SUBSTANCES, 1990


North America - 36%
Western Europe - 25%
Japan, Australia and New Zealand - 15%
CIS, Eastern Europe and Developing Countries - 24%
Refrigeration and air-conditioning - 32%
Fire extinguishing and other uses - 4%
Polymers - 9%
Solvents - 16%
Aerosols - 17%
Foams - 22%

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Since UNEP's earliest days, the ozone layer has been high among its concerns. Expert groups convened by UNEP, with the World Meteorological Organization (WMO), the scientific community and industry, clarified the issues and led to the development of the Vienna Convention for the Protection of the Ozone Layer, which was adopted in March 1985.

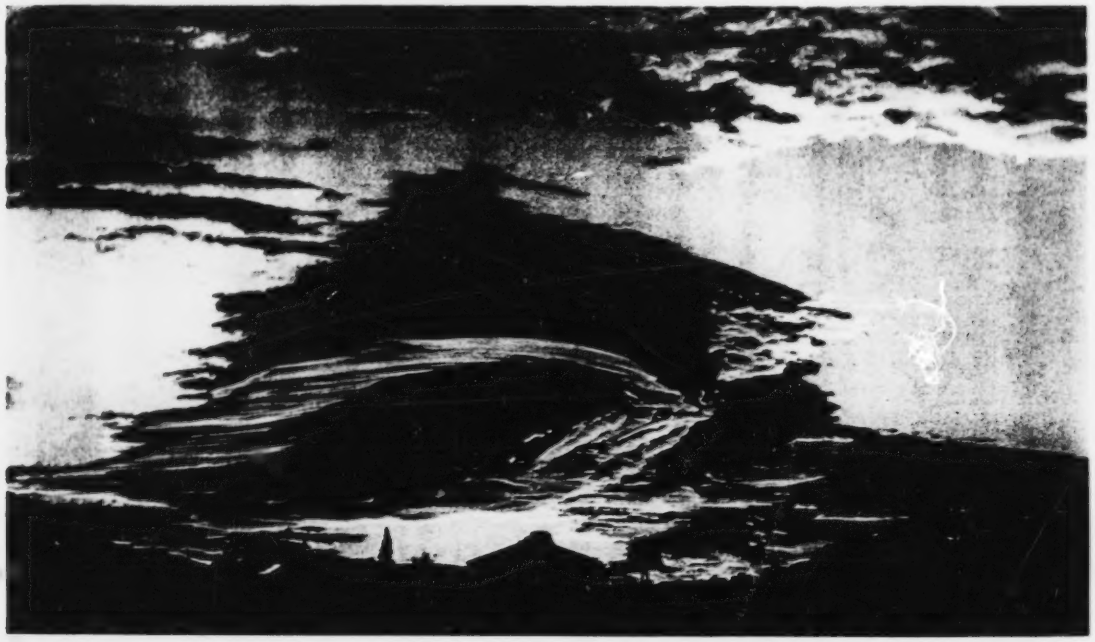
ACTION

The convention was so designed that protocols requiring specific control measures could be added. In September 1987 the Montreal Protocol on Substances that Deplete the Ozone Layer was signed. It set limits for the production and consumption of CFCs and halons, thus curbing the levels of chlorine and bromine reaching the stratosphere.

The Montreal Protocol came into force on 1 January 1989, and was amended in June 1990 after research showed that ozone depletion was even more severe than previously feared. CFCs, halons and carbon tetrachloride (another ozone-depleting chemical, used as a solvent) are now to be phased out by 2000 and a timetable has been set for phasing out other harmful substances. A multilateral fund, involving UNEP, UNDP and the World Bank, was established to help developing countries meet the costs of complying with the revised protocol and provide for the necessary transfer of technology.

Before the end of 1992, it is expected, the protocol will be further amended to bring forward the phasing-out of the destructive chemicals. The chemicals which have replaced them are less harmful to the ozone layer, but still do some damage. So target dates will be set for their replacement with harmless alternatives.

The Montreal Protocol has demonstrated that genuine partnership between North and South can be achieved. It offers a hopeful precedent as the international community moves to address more complex global environmental issues.



CLIMATE CHANGE

The Earth's temperature balance is maintained by a subtle interplay of forces. Without them, the Earth would be 33°C colder than it is today.

Radiation from the sun passes through the atmosphere, warms the Earth and is reflected back into space. 'Greenhouse gases' in the atmosphere trap some of this radiation, keeping the planet warm enough for life to flourish.

This natural greenhouse warming, caused mainly by carbon dioxide and water vapour, is spiralling out of control as a result of human activities. The burning of fossil fuels and deforestation release carbon dioxide into the atmosphere: concentrations are now 25 per cent higher than in pre-industrial times and are rising by 0.5 per cent each year. Other greenhouse gases include methane, whose concentration is rising by nearly 1 per cent a year, nitrous oxide, increasing at about 0.3 per cent a year, and CFCs.

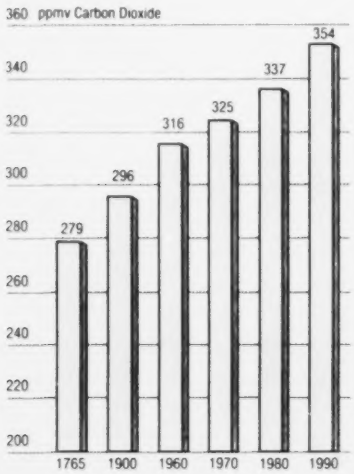
The contribution of each of these gases to global warming varies. A complex web of interacting mechanisms is involved. For example, CFCs both destroy ozone in the stratosphere and act as greenhouse gases. Ozone depletion cools the climate, and this nearly offsets the CFCs' heating effect. Other emissions – including dust from volcanoes – cool the climate by absorbing and reflecting radiation, although their lifetime is much shorter than that of greenhouse gases.

If no action is taken to regulate greenhouse gas emissions, the Earth could heat up by 0.3°C a decade. Over the next century this would mean a warming of between 2° and 5°C, with the best estimate around 3°C – a change unprecedented in the past 10,000 years.

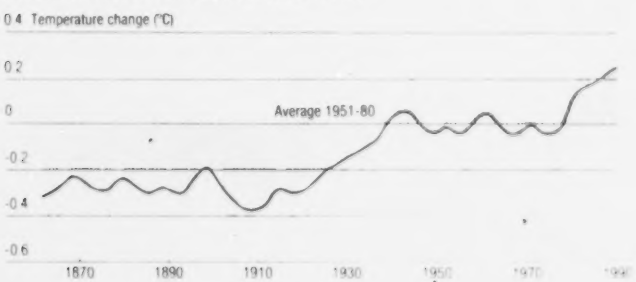
Resulting shifts in temperature and rainfall could move climatic zones several hundred kilometres towards the poles, disrupting agriculture and ecosystems. Levels of food production could fall steeply near the equator and tropics: water-critical areas such as the African Sahel are particularly vulnerable. Meanwhile growing seasons might extend nearer the poles. Flora and fauna would either flourish in a more benign climate or perish in a less hospitable one, thus altering the structure of existing ecosystems.

Global warming will accelerate sea-level rise, modify ocean circulation and change marine ecosystems, with considerable socio-economic consequences. Sea levels are expected to rise by 20cm by 2030 and by 65cm by 2100, flooding low-lying islands and coastal areas. Cropland could disappear, water supplies could be contaminated and tens of millions of people could lose their homes.

INCREASE OF CARBON DIOXIDE IN THE ATMOSPHERE SINCE 1765



GLOBAL CHANGE IN TEMPERATURE (1861-1989)



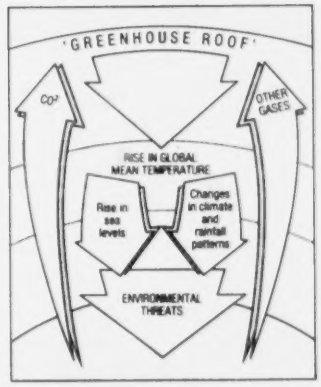
ACTION

In 1985, UNEP, WMO and the International Council of Scientific Unions (ICSU) convened a climate conference in Villach, Austria. It provided the opportunity for the in-depth exchange of scientific findings and laid the ground for more detailed systematic work.

A clear scientific consensus has since emerged on the range of global warming which can be expected during the 21st century, in spite of uncertainties about regional variations and environmental consequences. This consensus owes much to research and assessment which UNEP helps implement within the WMO World Climate Programme and to the work of the Intergovernmental Panel on Climate Change (IPCC) set up by UNEP and WMO in 1988.

In 1990, the Second World Climate Conference was organized by UNEP, WMO, the United Nations Educational, Scientific and Cultural Organization (UNESCO), FAO and ICSU. It reviewed the work of the IPCC and concluded that 'technically feasible and cost-effective opportunities exist to reduce carbon dioxide emissions in all countries'. It urged nations and regions to 'take steps towards reducing sources and increasing sinks of greenhouse gases' and called for a global convention on climate change.

Negotiations began in early 1991 and led to the formulation of the United Nations Framework Convention on Climate Change, which was signed by 154 governments in Rio de Janeiro during the United Nations Conference on Environment and Development in June 1992.



The 'greenhouse effect' could lead to a wide range of environmental threats including:

Coastal inundation and erosion

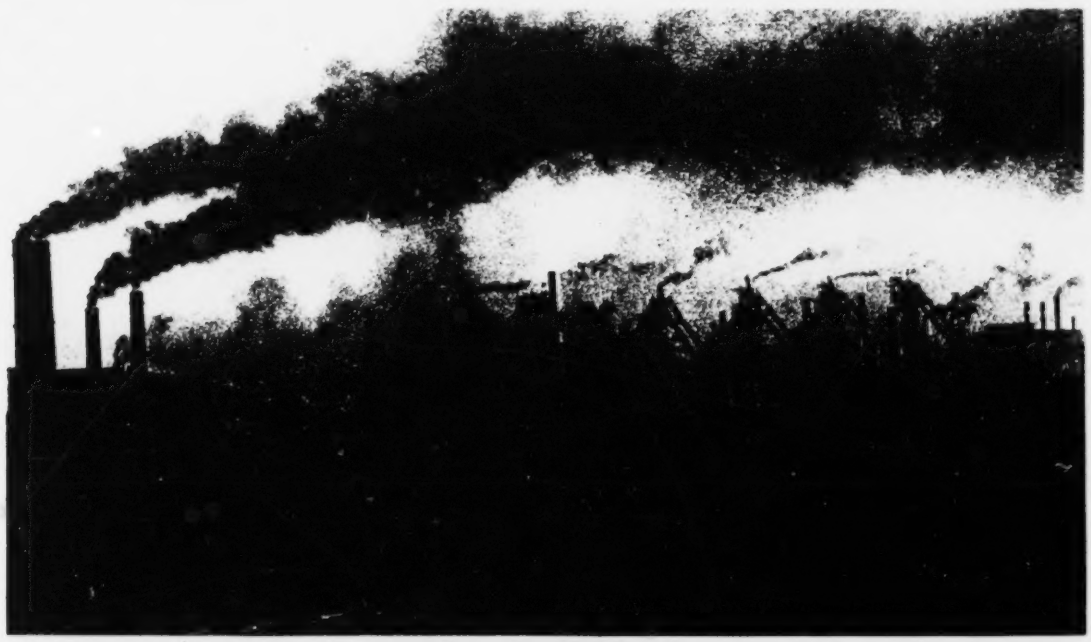
Rising water tables

Altered crop patterns

Desertification and famine

Movement of populations and new urbanization

National tension and refugees.



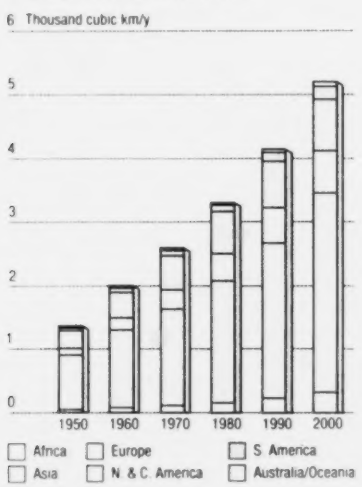
Management of freshwater resources

Only a tiny fraction of the water which covers the Earth is of use to humanity: 94 per cent is salt water, filling the oceans and seas. Of the remainder, 99 per cent is out of reach – frozen up in icecaps and glaciers, or buried deep underground.

Humanity can count on an annual supply of only some 9,000 cubic km of fresh water. Spread equally across the globe, this would be plenty, but rainfall is concentrated on temperate areas and the humid tropics. This leaves many areas short of water – notably the Middle East, North Africa, Central America and the south-western United States.

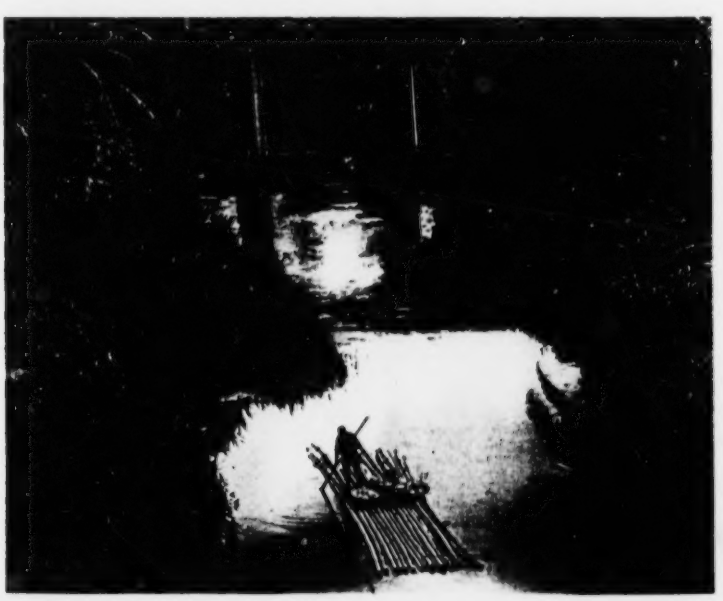
In the last 40 years, the world's water use has more than trebled. Averaged globally, agriculture used 69 per cent of the water withdrawn in the last two decades, industry 23 per cent and domestic users 8 per cent. The planet's water problems centre on quality as much as quantity. Industrial and human wastes, agricultural fertilizers, acid rain and seepage from toxic waste dumps all pollute water supplies. Most of the pollution that enters rivers does not stay there, but is carried to the oceans where it is joined by other pollutants discharged from land or precipitated from the skies. Coastal areas have suffered as a result.

TRENDS IN WATER WITHDRAWAL



The 1977 United Nations Water Conference in Mar del Plata, Argentina, highlighted global concern about water supplies. The UN General Assembly declared the 1980s the International Drinking Water Supply and Sanitation Decade. It provided some 1,348 million people in developing countries with safe water supplies and some 748 million with sanitation services. But at the end of the decade there were still about 1,232 million people without safe water, and about 1,600 million without sanitation.

Many of the world's freshwater resources are shared by two or more states. The use and protection of these bodies of water depend on cooperation between the nations along their banks.



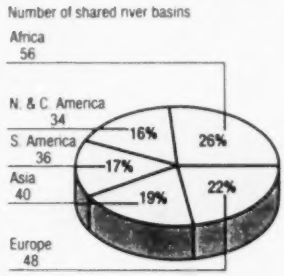
ACTION

UNEP promotes a comprehensive approach to the management of water resources, especially shared river basins, lakes and aquifers. Its programme for the Environmentally-Sound Management of Inland Waters (EMINWA), launched in 1986, helps governments to integrate environmental considerations into their inland water policies. It aims to reconcile conflicting interests and to ensure the regional development of water resources in harmony with the environment.

EMINWA's first project, at the request of the governments concerned, involved the Zambezi River Basin. Eight countries – Angola, Namibia, Botswana, Zambia, Zimbabwe, Malawi, Tanzania and Mozambique – share the waters of the Zambezi and its tributaries. In 1987 they signed the Zambezi Action Plan, which calls for a unified system of monitoring, assessment and development of the river basin. Its priorities include the provision of drinking water and sanitation, soil and forest conservation and fuelwood plantation, watershed management, wildlife and genetic conservation, pest control, fisheries projects and water quality control.

A master plan for the development of the natural resources of the Lake Chad Basin is in the final stages of preparation. Action plans are being developed for the Aral Sea in central Asia, the river basins of the Nile, the Danube and the Orinoco (in Venezuela) and for Lake Titicaca (Peru).

INTERNATIONAL RIVER BASINS

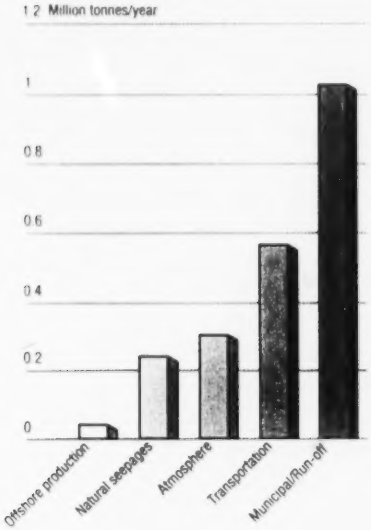


Protection of oceans and coastal areas

Seventy-one per cent of the Earth's surface is covered by sea. Through their interactions with the atmosphere, lithosphere and biosphere, the oceans have helped to shape the conditions which make life possible. They provide a habitat for a vast array of plants and animals and supply humanity with food, energy and mineral resources.

About 60 per cent of the world's population live within 100km of a shoreline. Most of the wastes created on land end up in the sea and remain trapped near the shore, poisoning the marine environment. Coastal waters contain many vital ecosystems and provide about 95 per cent of the living harvest of the seas.

SOURCES OF OIL POLLUTION OF THE SEA

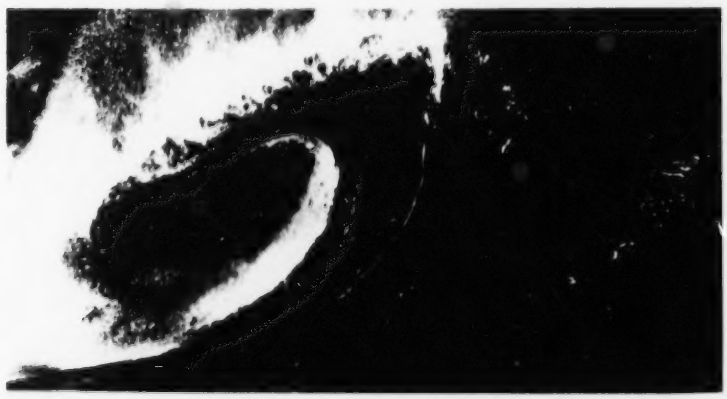


Every year, the world's rivers deliver about 35 trillion tonnes of water to the oceans, containing 3.9 billion tonnes of dissolved matter and from 10 to 65 billion tonnes of suspended particulates. Much of the 6.5 million tonnes of litter which find their way into the sea every year are plastics and other long-lasting synthetic materials. In many areas, sewage and agricultural run-off have caused massive algal blooms, poisoning marine life. Although oil concentrations in the sea are normally too low to threaten marine organisms, accidental oil spills, especially in coastal areas, can cause serious damage.

Coral reefs – home to a third of the world's fish species – are gradually being destroyed by pollution and overexploitation. So are the mangrove stands, another vital nursery for fisheries and wildlife. With them goes not only a source of food, but also a bulwark against coastal erosion.

The living creatures of the sea have long supplied humanity with food, oils and useful materials. Overfishing – as in the north-east Atlantic where cod and herring catches have plummeted – and pollution threaten these resources.

About 160 species of mammals live in the world's oceans. For centuries indigenous communities have hunted them on a sustainable basis, but advanced hunting methods are now taking their toll. Several species of great whale, all species of sea cow and some species of seal, dolphin and otter are endangered. Hundreds of thousands of marine mammals are also killed accidentally, when they become entangled in fishing nets. The use of drift-nets, sometimes 60km long, is causing particular concern.



ACTION

Faced with a global problem, UNEP decided in the mid-1970s to take a regional approach, addressing the challenge where it is most acute. Its Regional Seas Programme ties coastal nations together in a common commitment to mitigate and prevent degradation of the world's coastal areas, inshore waters and open oceans.

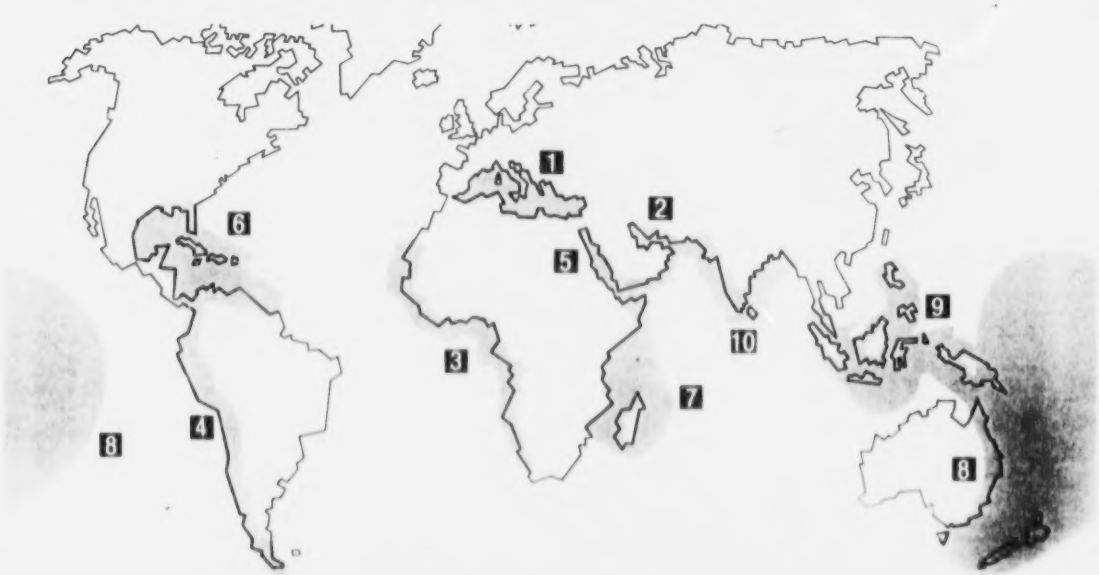
Today nearly 140 countries take part in Regional Seas Programmes catalyzed and coordinated by UNEP, covering the Mediterranean, the Kuwait region, the Red Sea, the wider Caribbean, the Atlantic coast of West and Central Africa, the Eastern African seaboard, the Pacific coast of South America, the islands of the South Pacific, the East Asian region and South Asia. Action plans for the Black Sea and the North-West Pacific are being developed.

Each programme is tailored to the special needs of its shoreline participants, but is made up of similar components – an Action Plan for cooperation on research, monitoring, pollution control and protection, rehabilitation and development of coastal and marine resources; a legally binding convention embodying general commitments; and detailed protocols dealing with specific issues, such as oil spills, dumping, emergency cooperation and protected areas. Funds for these activities come initially from UNEP and then from trust funds set up by the governments involved. So far UNEP has facilitated eight international conventions and 18 protocols and agreements on the protection of regional seas.

In 1977, UNEP and FAO initiated a Global Plan of Action for the Conservation, Management and Utilization of Marine Mammals. It was the first international attempt to define a rational strategy which embraces all species of marine mammals. Efforts to address the issue of drift-net fishing are being coordinated through the Global Plan.

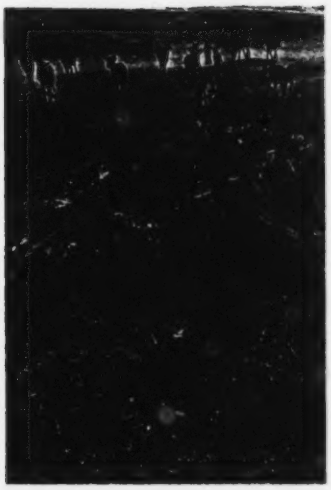
As concern mounts about global climate change, UNEP is examining the implications of temperature change and sea-level rise for vulnerable coastal regions and islands. This will help governments to plan how to respond to the threats.

The Regional Seas Programmes cover (1) the Mediterranean, (2) the Kuwait region, (3) the Atlantic coast of West and Central Africa, (4) the South East Pacific, (5) the Red Sea and Gulf of Aden, (6) the wider Caribbean, (7) the East African seaboard, (8) the South Pacific, (9) the East Asian seas and (10) the South Asian seas.



Protection of land resources

COMBATING LAND DEGRADATION AND DESERTIFICATION



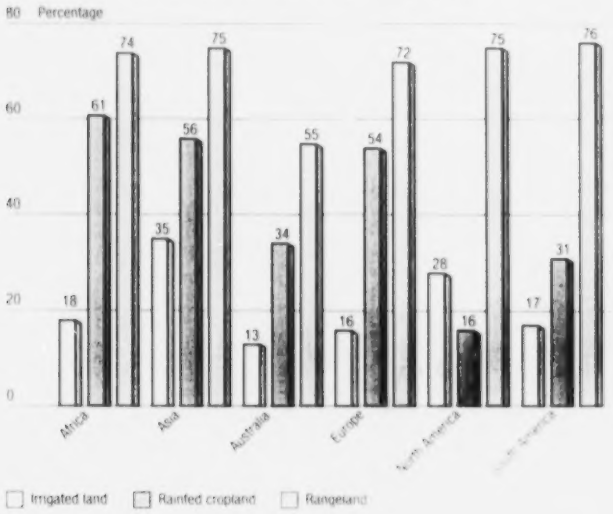
Soil takes thousands or millions of years to form – and a year or two to destroy. Most soil degradation is caused by human activities – overgrazing, deforestation, poor land management and overexploitation.

Fifteen per cent of the world's land has been degraded in this way, according to a recent global assessment carried out by the International Soil Reference and Information Centre in the Netherlands. Of this loss, nearly 55.7 per cent has been caused by water erosion, 28 per cent by wind erosion, 12.1 per cent by chemical degradation (such as salinization caused by inadequately drained irrigation) and 4.2 per cent by physical interference which results in waterlogging, compaction and subsidence.

Worst affected are the drylands which cover nearly half of the Earth's land area. Here land degradation caused by human action is called desertification, a term used to describe not the spreading of deserts but the creation of them. In the drylands, desertification affects just under half of the rainfed cropland, nearly three quarters of the rangeland and nearly a third of the irrigated areas.

While people are the main agents of destruction, they are also its victims. Land degradation is the main reason why farmers leave the countryside for the cities. Recurrent droughts dramatize the problem. The African drought of 1984-85 affected more than 30 million people in 21 countries; 10 million of them were driven permanently from their homes. These environmental refugees still suffer from intolerable living conditions and are haunted by disease, disability, malnutrition and death.

PERCENTAGE OF DRYLANDS AFFECTED BY DESERTIFICATION



ACTION

The United Nations Conference on Desertification in 1977 adopted a Plan of Action to Combat Desertification and charged UNEP with its coordination and implementation.

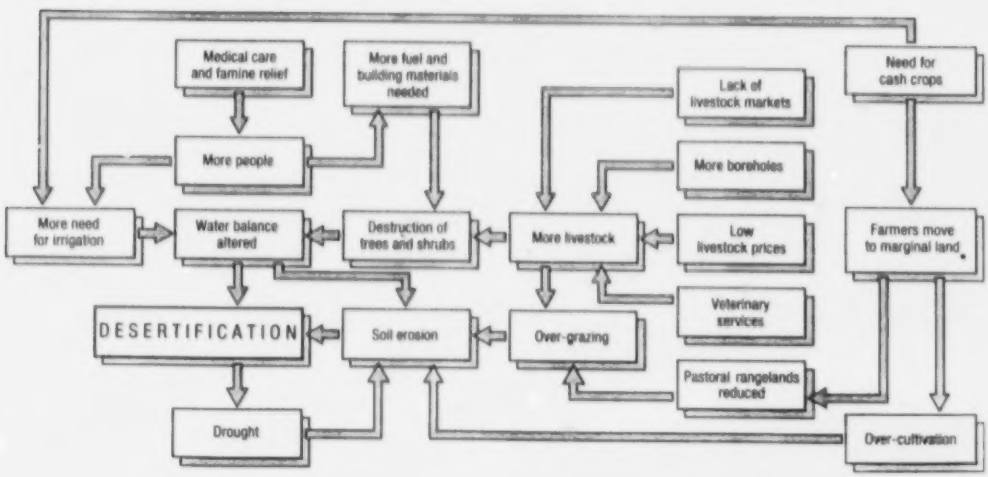
UNEP's work since 1977 has been wide-ranging and catalytic – coordinating the work of the UN agencies, through the Inter-Agency Working Group on Desertification; mapping degraded land, with FAO and other agencies; establishing regional networks on desertification; helping governments to draw up national plans of action; formulating pilot projects; training professionals and technicians from countries at risk; running grassroots information campaigns; and creating technical information data bases.

In particular, a joint venture between UNEP, UNDP and the UN Sudano-Sahelian Office has been helping 22 Sudano-Sahelian countries to fight desertification. In collaboration with the Southern African Development Coordination Conference, UNEP has finalized a plan of action for integrated land-use planning in the Kalahari/Namib area. UNEP has also supported the establishment of a green belt in North Africa.

In 1982, the Governing Council adopted a World Soils Policy, prepared by UNEP with the help of FAO and UNESCO. An Action Plan was launched by UNEP, with FAO and the International Society of Soil Sciences (ISSS), to assist developing countries in formulating and implementing national soil policies.

In spite of these efforts, the implementation of the Plan of Action to Combat Desertification has been slow. Institutional, administrative, technical and financial factors are all involved in this delay.

DESERTIFICATION: THE CAUSES ARE COMPLEX

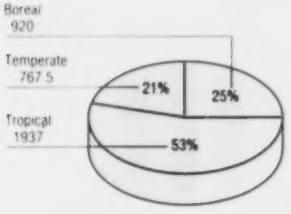


COMBATING DEFORESTATION

Trees cover over 25 per cent of the Earth's land surface. A quarter of these forests are boreal (northern and coniferous); a fifth are temperate and over a half are tropical. They provide millions of people with fuel, building materials, foods, fodder, medicine, fibres and employment.

All over the world, forests are being destroyed or degraded as a result of human activities. Over a third of Europe's forests – some 50 million hectares – have been harmed, to varying degrees, by air pollution, soil acidification and disease. Similar damage is common in North America and East Asia. In the tropics, 16.8 million hectares are destroyed every year by agricultural expansion, ranching, logging, and overexploitation for fuelwood.

WORLD DISTRIBUTION OF FORESTS
(million ha)



This loss has wide-ranging effects. When forests disappear, so do the peoples and species which live in them. Forests are one of nature's principle means of water management: when trees are felled, torrents of water run unchecked down steep hillsides, causing avalanches and flooding. Millions of people in Central America, the Caribbean, Africa and Asia have been refugeed by the environmental impacts of deforestation. Fuelwood, on which some 2 billion people depend, is scarce in most developing countries, and is becoming scarcer as the forests fall.

Trees also play an important part in stabilizing climate. Deforestation is responsible for between a quarter and a third of the carbon dioxide humanity has added to the atmosphere to date, increasing the risks of global warming.

BEST COPY AVAILABLE

In 1978, UNEP, FAO and UNESCO published a state-of-the-art report on how to evaluate forest resources. After pilot projects in Togo, Benin and Cameroon, UNEP and FAO embarked on a Tropical Forest Resource Assessment which was published in 1981.

ACTION

Between 1979 and 1985, a Tropical Forest Action Plan (TFAP) was developed, with contributions from FAO, UNEP, UNDP, the World Bank and the World Resources Institute (WRI). It provides a framework for environmental management and sustainable forest development at national, regional and global levels. So far, 81 countries have adopted the TFAP. FAO coordinates its implementation, with UNEP's collaboration.

Ecological considerations have been firmly embedded in the aims and activities of the International Tropical Timber Organization (ITTO), thanks to the efforts of UNEP, IUCN–The World Conservation Union, WWF–World Wide Fund For Nature and other NGOs. The ITTO was established in 1987 at Yokohama, Japan, to implement the International Tropical Timber Agreement, which came into force in 1985, under the auspices of UNCTAD. Through it, timber-producing and timber-consuming countries work together towards sustainable management of tropical forests.

To improve decision-makers' perception of the true importance of forests, UNEP, the University of Minnesota, FAO and the World Bank are preparing a practical manual on the assessment of forest value.

Conservation of biological diversity

The world's biological diversity is a vast and undervalued resource. It comprises every form of life, from the tiniest microbe to the mightiest beast, and the ecosystems of which they are a part. It provides humanity with a cornucopia of goods and services, from food, energy and materials to the genes which protect our crops and heal our diseases.

Of some 30 million species on Earth, only about 1.5 million have ever been described. Most species are found near the equator, with diversity peaking in the tropical forests and coral reefs. Up to 100 species of trees can be found in a hectare of Latin American tropical forest, as against 10 to 30 per hectare of forest in eastern North America.

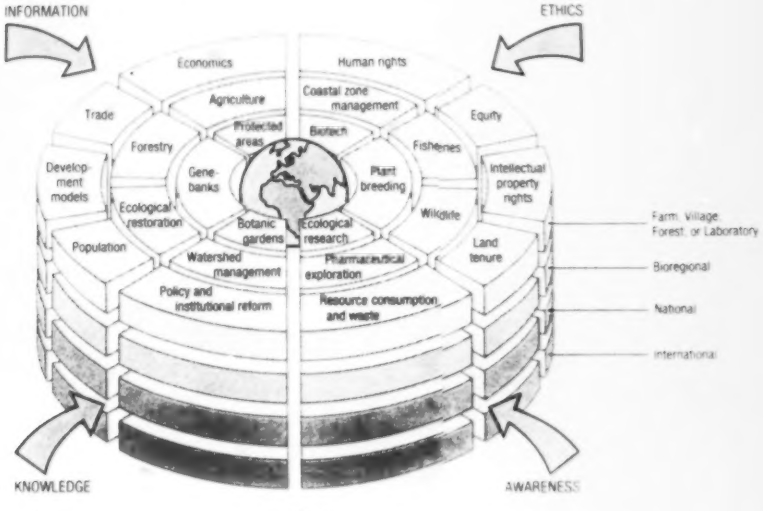
The planet's natural wealth lies not just in its species, but in the genetic variations within them. Genetic engineers can use these genes to develop medicines and foods. But specialized breeding has dangerously narrowed the genetic variability of many species, cutting their ability to adapt to pollution, climate change, disease or other forms of adversity.

Species disappear naturally over time – perhaps 99 per cent of all those that ever lived are gone – but human activity is speeding up this process. About one quarter of the Earth's species may be lost within the next 30 years.

Species die out as their habitats are destroyed. For instance, more than half the world's species live in the tropical forests. By 2020 deforestation could wipe out between 5 and 15 per cent of them. Overexploitation is another threat – commercial interests have jeopardized many species, including whales and elephants. Industrial and agricultural pollution have also taken their toll, while the introduction of competing species into established ecosystems can have devastating effects.

The loss of the Earth's biological diversity is one of the most pressing environmental and development issues today. With each species that disappears, developing countries – stewards of most of the planet's biological wealth – lose potential for sustainable development. As natural resources underpin – and are threatened by – every area of human activity, only the broadest possible cross-sectoral approach can save them.

THE SCOPE OF BIODIVERSITY CONSERVATION



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UNEP has sparked off a wide range of initiatives in this field, working with other concerned organizations through the Ecosystem Conservation Group established in 1975.

ACTION

In 1980, UNEP, IUCN and WWF launched the *World Conservation Strategy* (WCS) – the first comprehensive policy statement of the link between living resource conservation and sustainable development. It has been used by more than 50 countries as the basis for national conservation strategies. *Caring for the Earth*, launched by IUCN, UNEP and WWF in October 1991, reinforces the WCS and urges conservation as a matter of principle, survival and economic benefit. UNEP also helped to develop the *World Charter for Nature*, following the initiative of the Government of Zaire. It was adopted by the UN General Assembly in 1982.

UNEP supports the World Conservation Monitoring Centre (WCMC), which assesses the distribution and abundance of the world's species. Action plans for African elephants and rhinos, Asian elephants and rhinos, primates, cats and polar bears have been published by UNEP and IUCN.

UNEP also supports the International Board for Plant Genetic Resources (IBPGR), which has established a network of genebanks in 30 countries to house the world's 40 base collections. More than 100 countries collaborate and over 500,000 plant species have been collected, evaluated and deposited.

In collaboration with UNESCO's Man and the Biosphere programme, a network of 286 biosphere reserves in 72 countries and a network of six regional microbial genebanks and training centres (MIRCENS) have been set up.

UNEP provides the secretariat for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which entered into force in 1975 and prohibits or regulates trade in some 20,000 endangered species. UNEP also provides the secretariat for the Convention on the Conservation of Migratory Species of Wild Animals (CMS), which came into force in 1983.

In 1992, the WRI, IUCN and UNEP, in consultation with FAO and UNESCO, launched the *Global Biodiversity Strategy* after a worldwide series of workshops and deliberations. It lays out an international, national and local agenda to stem the tide of species loss and to meet human needs on a sustainable and equitable basis.

In June 1992, the Convention on Biological Diversity was signed during the UN Conference on Environment and Development in Rio de Janeiro. The convention was prepared by an Intergovernmental Negotiating Committee, set up by UNEP's Governing Council and assisted by UNEP, FAO, UNESCO and IUCN. Its main aims are to conserve biological diversity and ensure that its components are used sustainably and that the resulting benefits are equitably shared. This includes appropriate funding, access to genetic resources and transfer of technology – taking into account all rights involved.

Management of toxic chemicals and hazardous wastes

Every year, between 1,000 and 2,000 new organic and inorganic chemicals are added to some 100,000 already produced commercially.

All chemicals are toxic. The risk to human health and the environment depends on the degree of toxicity and length of exposure. In the last 20 years concern over acute health effects has broadened to include such chronic effects as birth defects, genetic and neurological disorders and cancer.

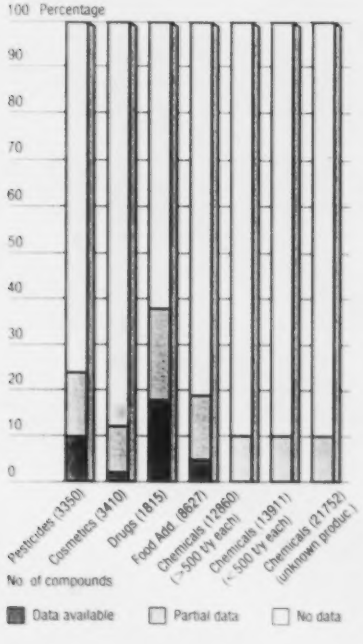
People release toxic chemicals into the environment directly (for instance as pesticides or fertilizers) and indirectly as wastes from other activities (such as mining, industrial processes, incineration and fuel combustion). Once released, many of the chemicals undergo transformation and some may be carried away by the elements to cause local, regional or global chemical pollution.

Humanity throws away billions of tonnes of waste every year. Those which contain potentially toxic chemicals are considered hazardous. Worldwide some 338 million tonnes of hazardous wastes are produced every year – 275 million in the USA and 25 million in Western Europe.

Over the years, most hazardous waste has been deposited in landfills or stored in surface impoundments. Leaks from such sites have contaminated groundwater and soil and in some cases, such as Love Canal in the USA, threatened public health. Out of 32,000 potentially dangerous sites in the USA, 1,200 need immediate remedial action – clean-up costs are estimated at $100 billion. Thousands of unsatisfactory sites have also been found in the Netherlands, Denmark and Germany.

In the early 1980s, concern began to rise in Europe and North America about the export of hazardous wastes for disposal or treatment. Most of these movements have been legal, caused by economic considerations. But as industrialized countries have tightened their controls over the movement and disposal of hazardous wastes, illegal dumping and traffic have increased. In the late 1980s, a series of scandals came to light, involving hazardous waste dumping in developing countries.

PERCENTAGE OF CHEMICALS WITH TOXICITY DATA



UNEP addresses the challenge of chemicals in the environment on several levels: through the International Register of Potentially Toxic Chemicals (IRPTC) – part of the Earthwatch programme (see p42); through the International Programme on Chemical Safety (IPCS); and through its work on agrochemicals.

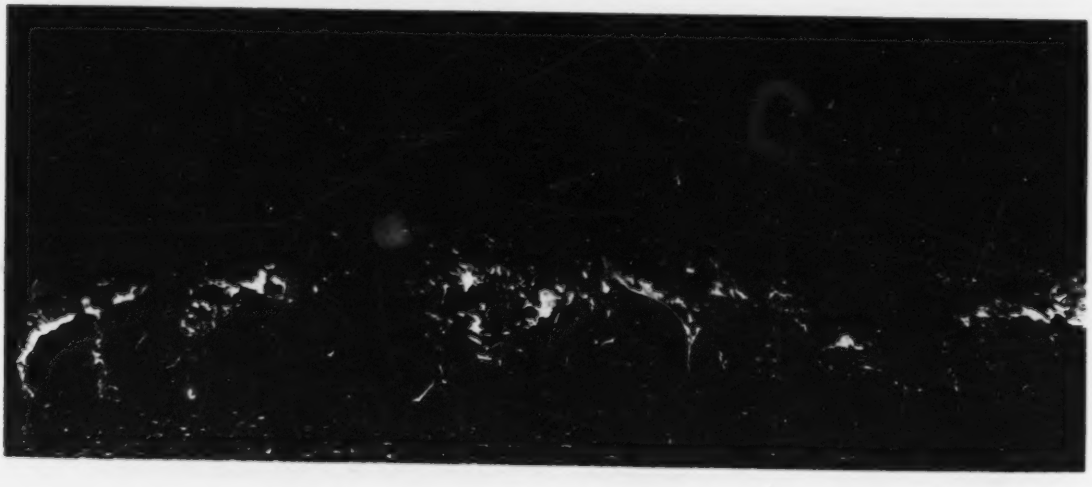
ACTION

In 1980, WHO, UNEP and the International Labour Organisation (ILO) set up the IPCS to assess the risks that specific chemicals pose to human health and the environment. It took over responsibility for the *Environmental Health Criteria* documents, which WHO supported by UNEP had been producing since the mid-1970s. In addition to these documents for scientific experts, IPCS publishes short, non-technical *Health and Safety Guides* for administrators, managers and decision-makers; international *Chemical Safety Cards* for ready reference in the workplace; and *Poisons Information Monographs* for medical use. To help countries without adequate facilities for coping with poisonings, IPCS has set up a computerized poisons information package (INTOX).

To monitor and regulate the trade in banned or severely restricted chemicals, UNEP's Governing Council adopted in 1989 the Amended London Guidelines for the Exchange of Information on Chemicals in International Trade, which include a procedure for prior informed consent (see under IRPTC p 42). UNEP also supported the 1986 FAO International Code of Conduct on the Distribution and Use of Pesticides, which was amended in 1989.

With FAO, UNDP and others, UNEP is promoting integrated pest management strategies to reduce the use of pesticides. UNEP, FAO and WHO cooperate through the Panel of Experts on Environmental Management for Vector Control (PEEM) to promote alternatives to pesticides in controlling vector-borne diseases.

In March 1989, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal – drafted by UNEP – was adopted by 116 governments and the European Community. The convention entered into force on 5 May 1992. Its ultimate aim is to cut the generation of hazardous wastes to a minimum. Its immediate target is to impose strict controls on those hazardous wastes which are allowed to cross boundaries and on their disposal.



Development and quality of life

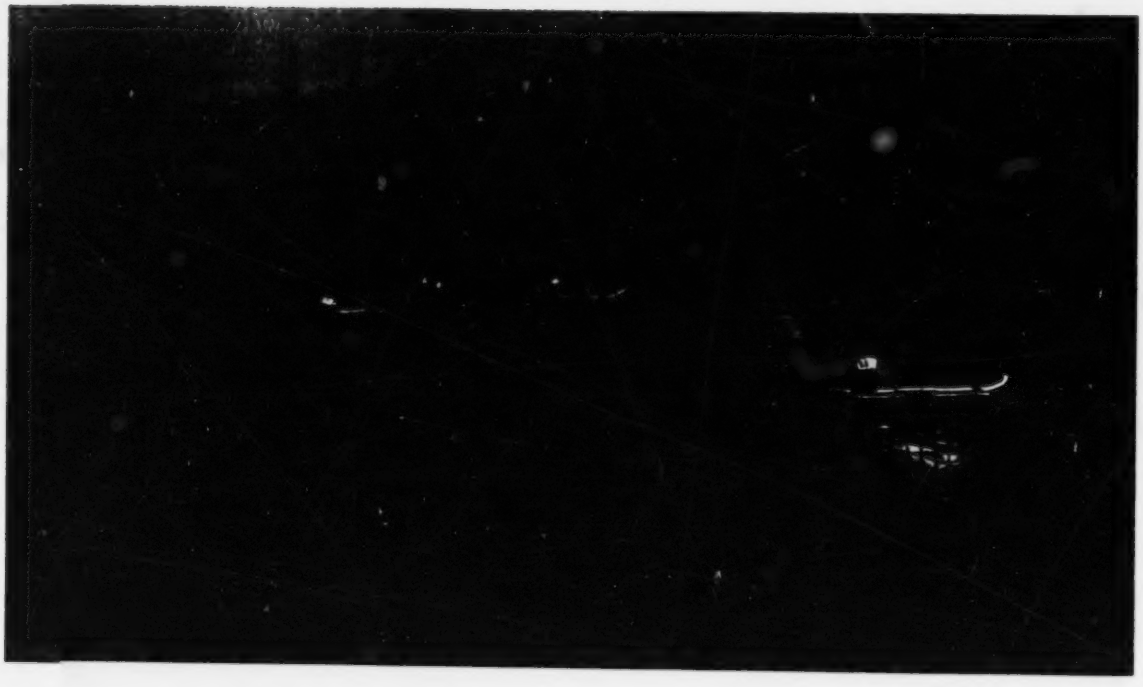
INDUSTRY

The world produces seven times as many goods and three times as much minerals as it did 20 years ago. Industry is the world's major polluter – responsible for about 90 per cent of the sulphur oxides, 50 per cent of the carbon dioxide and hydrocarbons, and up to 44 per cent of the nitrogen oxides and particulate matter that humanity releases into the environment. Two thirds of the oxygen depletion of surface waters can be traced to industrial wastewater – and nine tenths of their pollution with toxic substances.

Worldwide, industry generates over 2 billion tonnes of solid wastes and 338 million tonnes of hazardous wastes every year. The bulk of these (68 per cent of the solid wastes and 90 per cent of the hazardous ones) is produced in the countries of the Organization for Economic Cooperation and Development (OECD). Although some are recycled, many wastes require appropriate management to reduce their environmental impacts (see pp 28-29).

About 180 severe industrial accidents have occurred in different countries over the last two decades – killing some 8,000 people, injuring over 20,000 and displacing hundreds of thousands. Accidents in crowded cities in the developing world – such as those in Mexico City and Bhopal, India, in 1984 – have caused the most casualties. Such disasters are becoming more frequent.

The location of industries and the environmental impacts of small-scale industries and of new technologies are receiving growing attention.



A greening of industry is taking place – partly as a result of the catalytic and coordinating initiatives of UNEP's Industry and Environment Programme Activity Centre (IE/PAC).

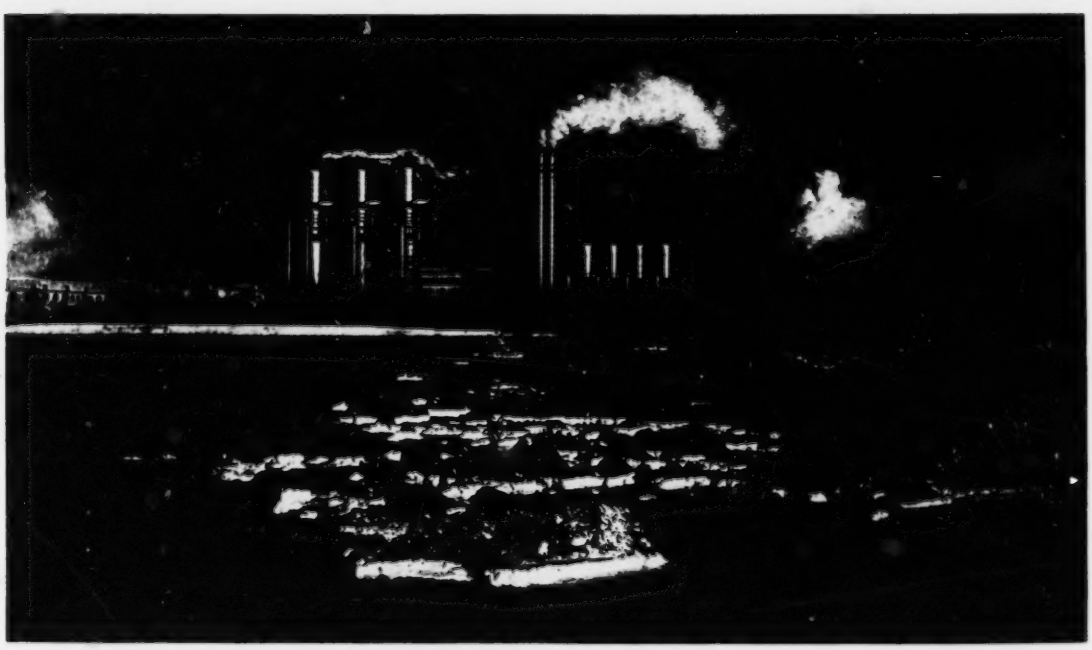
Traditionally, industries take in raw materials and generate products for sale, plus wastes for disposal. This model is gradually being transformed into a more integrated model – an 'industry ecosystem', which consumes the minimum of energy and materials, generates the minimum of wastes and uses the effluents of one process as the raw materials for another.

ACTION

In 1984, UNEP and the International Chamber of Commerce (ICC) convened the first World Industry Conference on Environmental Management (WICEM I), which committed itself to develop and promote environmental management in industry. In 1991, WICEM II issued the *Business Charter on Sustainable Development*, which is being adopted by companies worldwide. UNEP's Cleaner Production Programme promotes and disseminates information on low-waste technologies.

In 1988, in response to a number of industrial accidents, UNEP launched the Awareness and Preparedness for Emergencies at Local Level (APELL) programme. It aims to alert communities to industrial hazards and to help them to develop emergency response plans. It disseminates information, offers training and promotes the exchange of information and assistance in the case of emergencies. APELL now has a network of 69 national focal points.

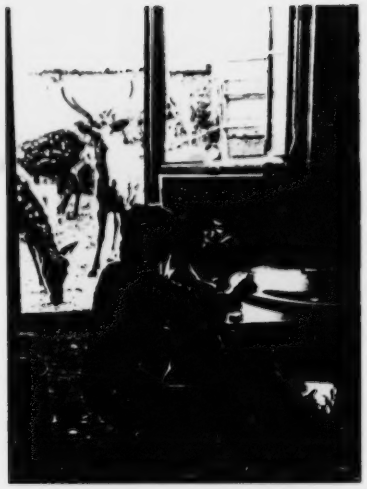
The cooperation of the chemical industry has been an important driving force in the action to phase out chemicals which deplete the ozone layer (see pp 14-15). The IE/PAC has developed the OzonAction Information Clearing House to provide information and training pertaining to the OzonAction Programme.



ENERGY PRODUCTION AND USE

The fifth of the Earth's population which lives in the developed countries consumes over four fifths of the commercial energy produced. On average, an inhabitant of a high-income country burns 15 times more energy than someone in a low-income country, and about four times more than someone in a middle-income one.

Energy production, transformation, transport and use all have impacts on the environment. These vary according to the source of energy, the way it is produced and how it is used – in agriculture, industry, transport, commerce or homes.



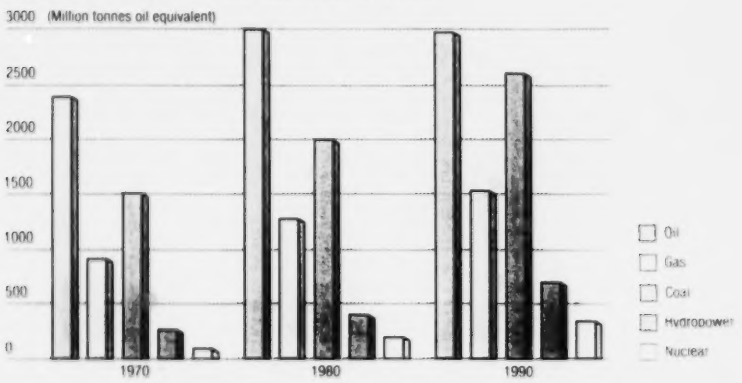
Eighty-five per cent of the commercial energy used worldwide comes from fossil fuels. Its use accounts for some 90 per cent of the sulphur oxides, 85 per cent of the nitrogen oxides, 30-50 per cent of the carbon monoxide, 40 per cent of the particulate matter, 55 per cent of the volatile organic compounds, 15-40 per cent of the methane and 55-80 per cent of the carbon dioxide released by human activities.

Non-commercial sources of energy – such as fuelwood and agricultural residues – account for about 12 per cent of the world's energy use, but over 2 billion people in the developing countries depend on these fuels. As the demand for fuelwood increases and forests disappear it is estimated that, by the year 2000, 2.4 billion people will either go short of energy or have to consume wood faster than it is grown.

Fossil-fuel-fired power stations generate just over two thirds of the world's electricity, while hydropower accounts for a fifth, nuclear power for 17 per cent and geothermal resources for less than 1 per cent. Concern about nuclear power focuses on the effect of radiation on people, the safety of nuclear plants, the environmental impacts of radioactive waste management (including the decommissioning of plants) and the risks of nuclear material being diverted for non-peaceful uses. The accidents at Three Mile Island in 1979 and at Chernobyl in 1986 have increased opposition to nuclear power and slowed down nuclear programmes in several countries.

In the last 20 years energy conservation, changes in the energy mix and the control of emissions have cut pollution in OECD countries, although there has been less progress in developing countries. There have also been advances in the exploitation of renewable sources of energy, especially for specific tasks in rural and remote areas.

WORLD COMMERCIAL ENERGY CONSUMPTION BY SOURCE



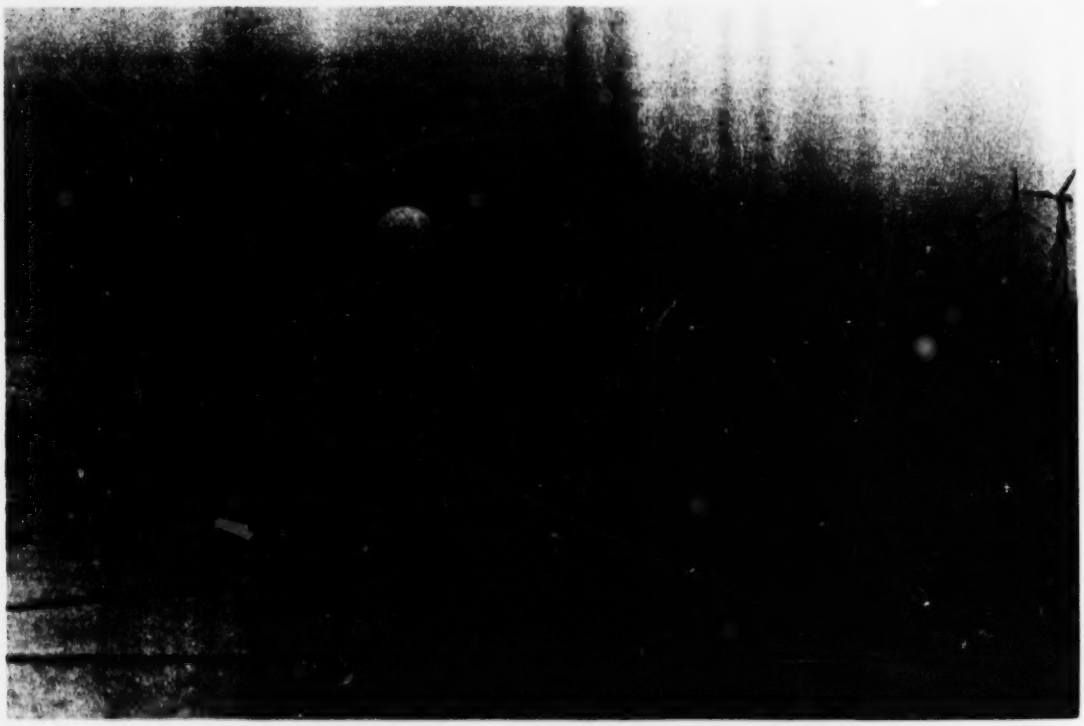
ACTION

Since its inception, UNEP's energy programme has made a priority of assessing the environmental impacts of all forms of energy production and use. In 1981, UNEP completed a comprehensive assessment of the environmental impacts of fossil fuels, nuclear power and renewable sources of energy. UNEP has also been concerned with the impacts of low-grade sources of energy, such as oil shale and tar sands.

In the 1970s, UNEP took the lead in promoting the use of renewable sources of energy and introduced the concept of rural energy centres by supporting demonstration projects in Sri Lanka, the Philippines and Senegal.

UNEP has also supported activities related to bioenergy in Bolivia, Brazil, Kenya and Uganda. The development of more efficient fuelwood stoves has been of particular importance.

In 1990, UNEP established an Energy Collaborating Centre at Roskilde, Denmark, in cooperation with the Danish International Development Agency and the Riso National Laboratory. Its primary task is promoting the development of environmentally-sound national energy plans. The first pilot project is underway in India in cooperation with the Indian Government and the Tata Research Institute.



HUMAN SETTLEMENTS

Most people still live in the country. Villages, farmsteads and herding camps far outnumber towns and cities: in 1990, 57.4 per cent of the world's population lived in them. But the balance is changing. By 2025 about 60 per cent of the Earth's population will live in urban areas.

For many, life in the country is hard. Disenchanted farmers and smallholders flee to the city in search of an easier life and better jobs. Each year towns and cities in the developing world must absorb more than 80 million new people. Communications, transport, services and water supplies crack under the strain. The result is, at best, urban sprawl and, at worst, mushrooming urban slums.

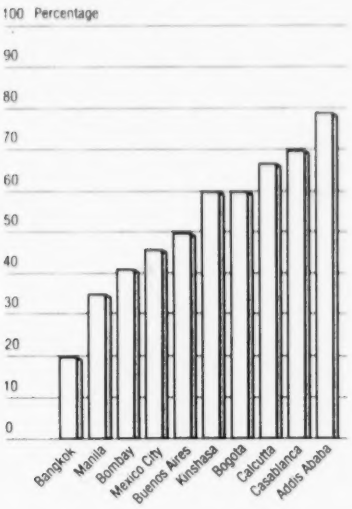
About one third of the city-dwellers in developing countries live in slums and shanty towns, where clean water is scarce, fuel expensive, refuse rarely collected, disease endemic and violence common. There is also a gulf in standards of living within the cities of the rich world, where an urban underclass is caught in a vicious circle of deterioration and neglect. The costs of these conditions are staggering – not just in terms of human suffering but, both directly and indirectly, for society itself.

In developing countries an average of 2.4 people live in each room. Up to three quarters of the population of these countries cannot afford what is defined as standard accommodation, nearly a fifth of city dwellers go without clean water, while over a quarter have no sanitation. Infant mortality in the slums is often three times that of wealthy urban areas. Worldwide, some 100 million people have no form of shelter at all.

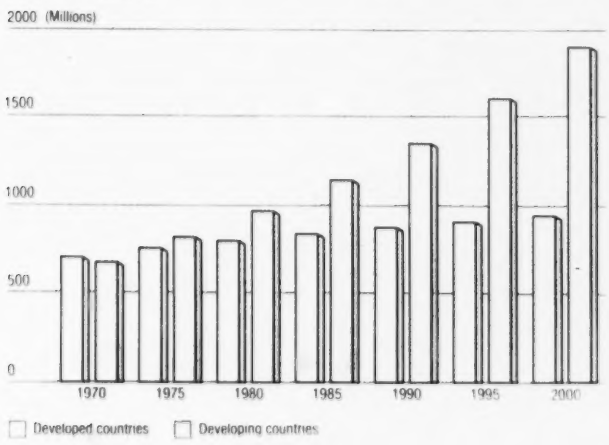
Almost everywhere, civic authorities have been unable to cope with the challenge of housing poor families. Few mechanisms have been found for financing, while grassroots movements are often thwarted by inflexible policies and institutions.

The UN's Global Strategy for Shelter to the Year 2000, launched in 1989, is one sign of hope. It urges an 'enabling approach' to mobilize the full potential and resources of all involved in building and improving shelter.

URBAN POPULATION LIVING IN SLUMS OR SQUATTING



URBAN POPULATION



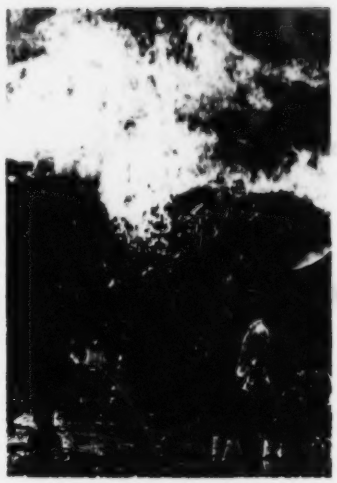
ACTION

UNEP played a major role in the preparation for the 1976 UN Conference on Human Settlements in Vancouver and has cooperated fully with the UN Centre for Human Settlements (Habitat) since it was set up in 1977.

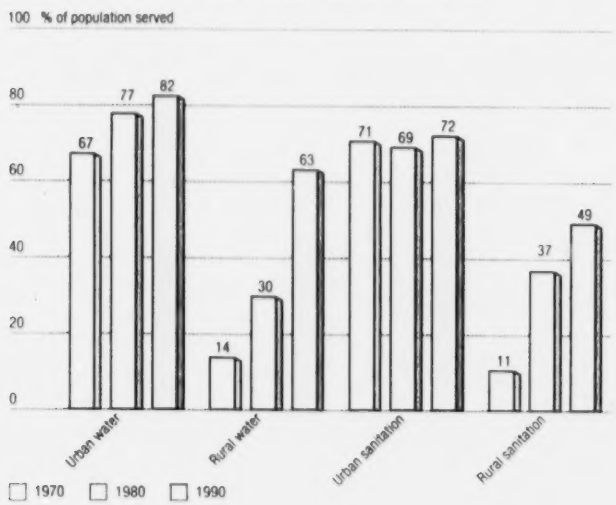
UNEP and Habitat have developed environmental guidelines for urban development, which are being applied in cities as part of a bid to make urban management more responsive to the environment.

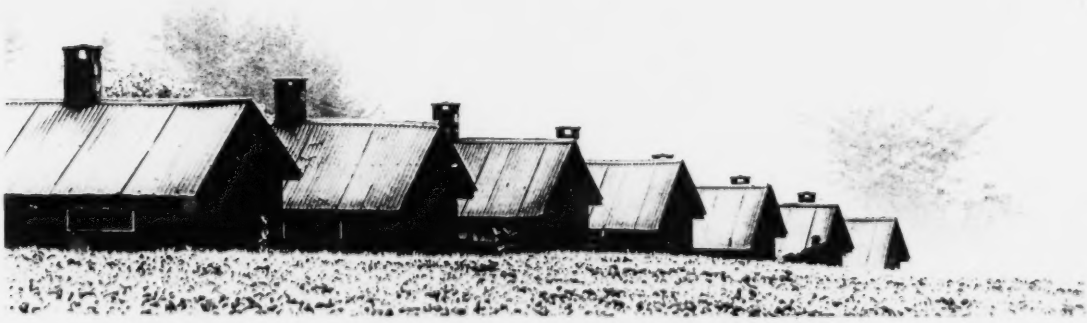
UNEP has backed demonstration projects for the rehabilitation of squatter settlements in the Philippines and Indonesia and has supported the 'greening' of Dodoma, the new capital of Tanzania.

UNEP and Habitat have set up a project in Democratic Yemen to demonstrate a model for planning and building settlements which take environmental parameters into account.



WATER SUPPLY AND SANITATION IN DEVELOPING COUNTRIES





HUMAN HEALTH

A sick environment undermines the health of its inhabitants, whether at home, at work or in the neighbourhood.

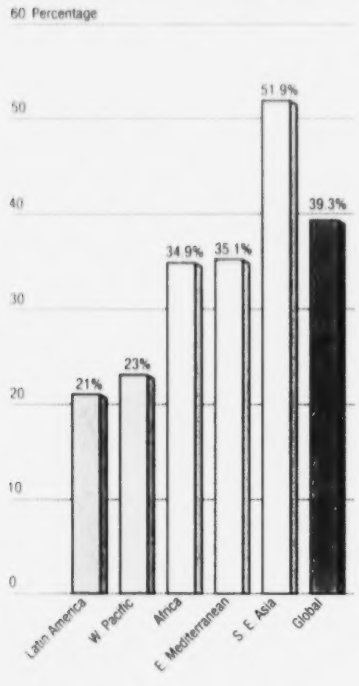
Insanitary and infested living conditions kill about 17 million people every year, some 11 million of them under the age of five. Nearly half of all deaths in developing countries are caused by infectious or parasite-borne diseases.

Contamination of drinking water and food is the main cause of outbreaks of cholera. An estimated 100 million people suffer from malaria every year: the disease is endemic in 102 countries, placing over half the world's population at risk. Some 200 million people are infected by schistosomiasis and another 600 million people are at risk, in 76 developing countries.

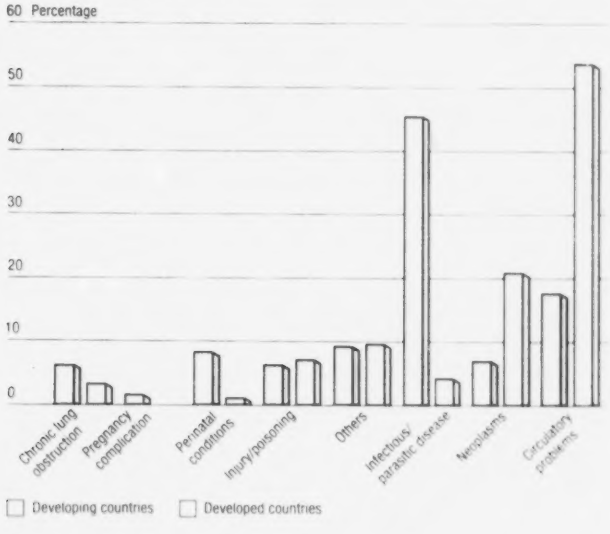
Humans encounter chemicals at work and in the community. Special exposure limits and other regulations have been established to protect those who work with chemicals. Yet a million unintentional acute poisonings are caused by pesticides alone every year: pesticides kill some 20,000 people each year. Industrial accidents, such as Bhopal, or air pollution crises, such as the London smogs of the 1950s, cause major concern.

The short-term effects of exposure to high levels of many toxic chemicals are now well understood: less is known about what happens to people exposed to very low concentrations over 20 or 30 years. There is widespread agreement that 85 per cent of all cancers are caused by such broad environmental factors as ionizing radiation, carcinogens in air, food or water, smoking, alcohol and drugs. While the effects of some individual pollutants have been established, we still do not know enough about the combined risks to which people are exposed in air, food and water.

MALNOURISHED CHILDREN 6-60 MONTHS



CAUSES OF DEATH (Mid-1980s)



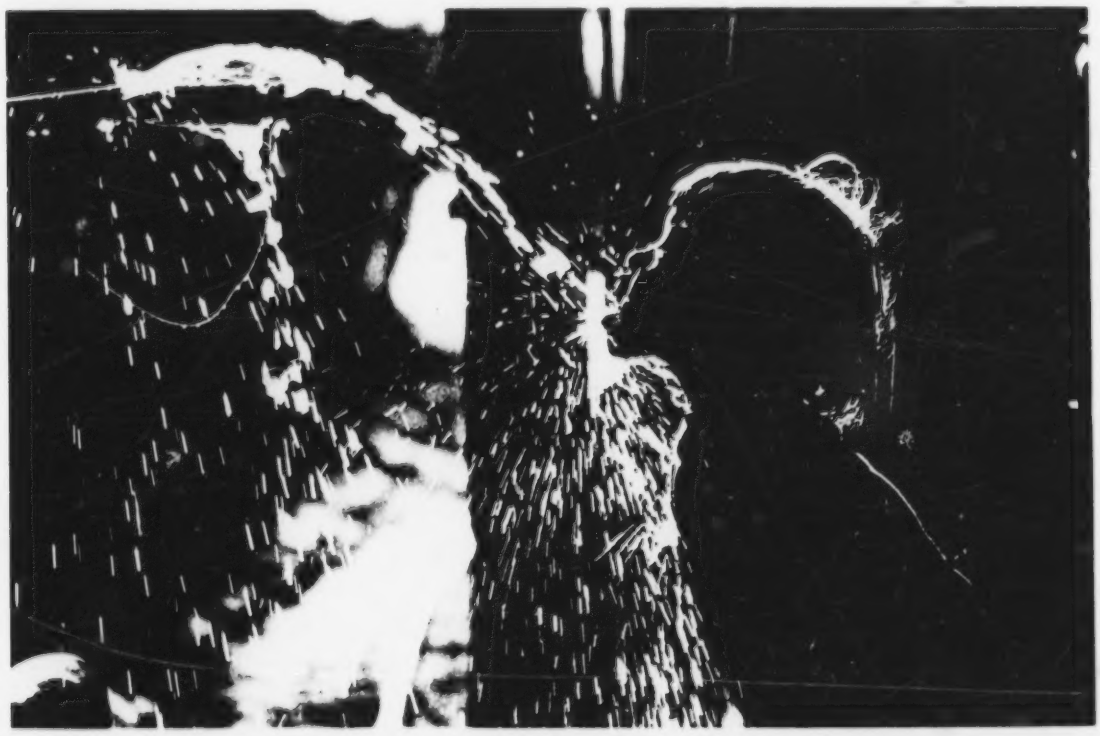
ACTION

Most of UNEP's work has some impact on human health: from the fight against land degradation, through health-related monitoring, to its programmes on chemicals, pest and vector control, and water management.

Through the International Programme on Chemical Safety (IPCS), UNEP, WHO and the ILO cooperate closely on assessments of the risks posed by toxic chemicals to health and the environment (see pp 28-29).

UNEP, FAO and WHO promote environmental means of controlling the vectors of malaria, schistosomiasis and sleeping sickness, through the joint Panel of Experts on Environmental Management for Vector Control (PEEM). The three UN bodies also work together on the assessment, monitoring and control of mycotoxins, released by fungi into poorly stored food.

Several GEMS monitoring activities (see pp 39-42) are related to health. Of particular importance is the Human Exposure Assessment Locations programme (HEALs), set up by WHO/UNEP to monitor total human exposure to pollutants. The results should enable countries to assess the combined risk from air, food and water pollutants and to take appropriate action.



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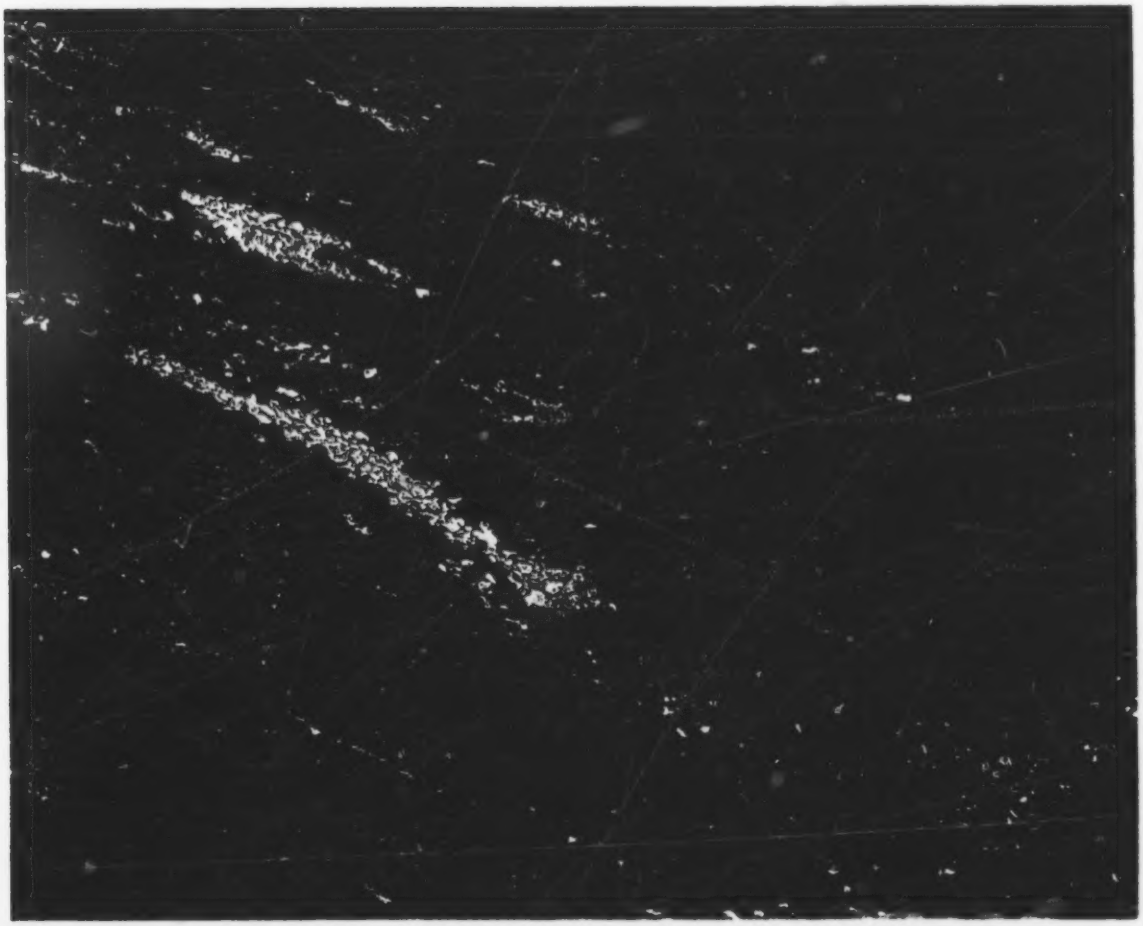
Earthwatch

The first step in planetary management is to find out exactly what is going wrong – and why – and whether it is getting worse. The second is to make this information available to those who can do something about it.

In the past, scientists across the world have worked in isolation – using different means and standards of measurement, which made it hard to compare results and come to a diagnosis. As a result, environmentalists and decision-makers have confronted each other across a chasm of scientific uncertainty – with inadequate information prompting accusations of scaremongering on one side and of inactivity on the other.

The Action Plan for the Human Environment adopted by the Stockholm Conference in 1972 includes a global environmental assessment programme, referred to as Earthwatch. It states four aims: to provide a basis on which to identify the knowledge needed and take the steps to find it; to generate the new knowledge specifically needed to guide decision-making; to gather and evaluate specific data in order to discern and predict important environmental conditions and trends; and to disseminate knowledge to scientists and technologists and provide decision-makers at all levels with the best information available, in useful forms and at the right times.



The Earthwatch programme of UNEP consists at present of four main components: the Global Environment Monitoring System (GEMS), the Global Resource Information Database (GRID), the International Register of Potentially Toxic Chemicals (IRPTC) and the global information system, INFOTERRA.

ACTION

GEMS *Global Environment Monitoring System*

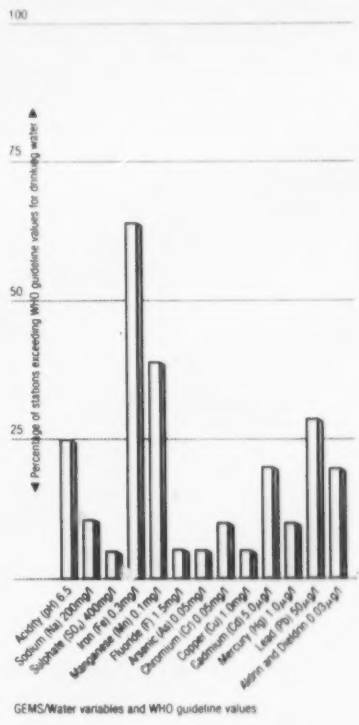
GEMS is a worldwide collective effort to monitor the global environment and assess the health of its constituents.

In 1975, UNEP established the GEMS/Programme Activity Centre, not to replace existing monitoring systems but to link them and to catalyze new stations and networks to fill any gaps. GEMS/PAC works together with UN bodies, national governments, and national and international institutions. Its activities fall into four interrelated areas: atmosphere and climate, environmental pollution, renewable resources and environmental data.

Climate data gathered within the framework of GEMS have spurred international action to save the ozone layer and to mitigate the effects of climate change. Two of the main networks involved are the World Glacier Monitoring Service and the WMO/UNEP Background Air Pollution Monitoring Network (BAPMoN).

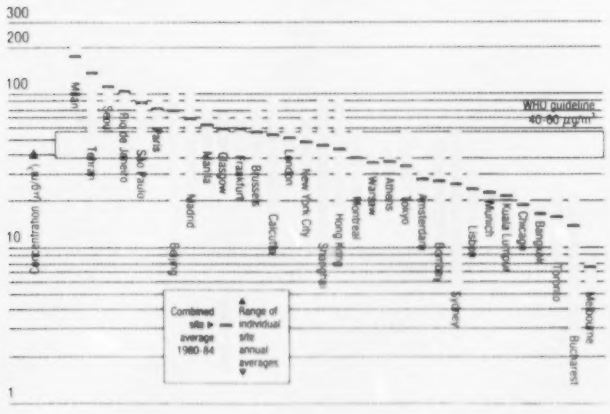
As the world's glaciers advance and retreat, they act as a thermometer of climatic change. The World Glacier Monitoring Service, backed by UNEP, UNESCO and the Swiss Federal Institute of Technology, incorporates over 750 glacier stations in 21 countries and has published the first survey of all the world's glaciers and permanent icefields, *The World Glacier Inventory*. Now that the main mass-balance change survey has been completed, a geographically representative selection of glaciers is being examined every year.

WATER QUALITY



GEMS/Water variables and WHO guideline values

ANNUAL SULPHUR DIOXIDE AVERAGES IN SELECTED CITIES, 1980-1984



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While the glacier network looks for signs of climate change, BAPMoN and WMO's Global Ozone Observing System keep track of air pollutants, including greenhouse gases, and of changes in the ozone layer. The BAPMoN network – implemented by WMO – covers 95 countries, with data from regional stations influenced by centres of population and industry set against those from baseline stations in isolated areas where the air is relatively clean. Data from BAPMoN are also being used as input to a global assessment of acid deposition and its consequences.

PARTICIPANTS IN GEMS MONITORING OF ENVIRONMENTAL POLLUTANTS

AIR

WATER

FOOD

GEMS gives high priority to the monitoring of environmental pollutants. Chemical pollutants in the air, water and even food pose a constant threat to human health – sometimes subtly, in ways that go unnoticed for decades, and sometimes dramatically.

FAO, WHO and the GEMS Monitoring and Assessment Research Centre in London cooperate in this monitoring. The networks involved cover more than 75 countries. In the past two decades, the monitoring capabilities of over 25 developing countries have been strengthened. Three major global assessments – on urban air pollution, freshwater contamination and food contamination – were published in 1988.

The Chernobyl disaster in 1986 exposed weaknesses in existing national and international radiation monitoring systems, and in arrangements for the exchange of information after such accidents. In response, WHO and UNEP established a global environmental radiation monitoring network (GERMON) in cooperation with other UN bodies and national institutions. Its main, routine, function is to provide information on levels of radioactivity under normal conditions. If GERMON detects abnormally high levels, it will circulate its findings and any other details of a nuclear accident to the countries affected.

GEMS/PAC activities in the field of renewable resources focus on forest, soil, land degradation and terrestrial ecosystems monitoring and on biodiversity. Ocean monitoring is covered by UNEP's Oceans and Coastal Areas PAC. The IUCN/WWF/UNEP World Conservation Monitoring Centre in Cambridge, UK, maintains databases on endangered species, critical habitats, parks and protected areas and wildlife trade and compiles the IUCN Red Data Books on rare and endangered species. UNEP and FAO have been working together on assessments of global forests, while a desertification atlas was published recently by UNEP's Desertification PAC and the International Soil Reference and Information Centre (ISRIC) in the Netherlands.

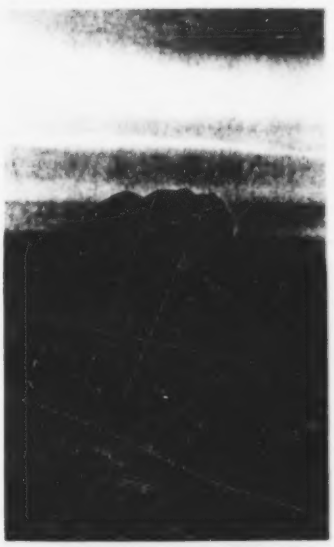
GEMS supports the publication of biennial environmental data reports, biodiversity status reports and world resources reports, which include up-to-date comprehensive lists of global environmental data.

GRID *Global Resource Information Database*

GRID – a new tool for decision-makers – was launched within the framework of GEMS in 1985 and became a Programme Activity Centre in 1991.

GRID uses computer technology to process and analyze data and produce environmental maps and print-outs, which can be used by planners. It is based on environmental geographic information systems (GIS), which can be used with mainframe computers to study global issues or with microcomputers to study national or local ones.

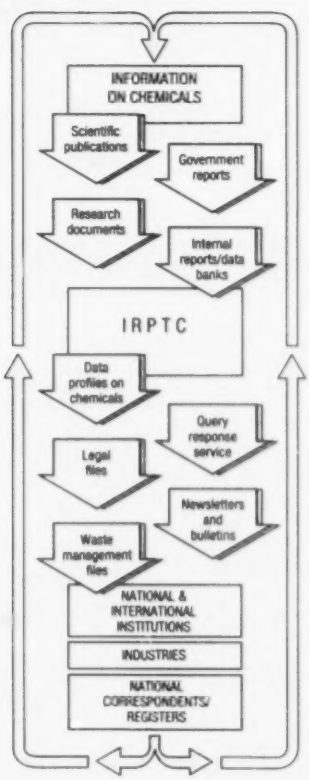
GRID's task is threefold: to compile geographically-referenced environmental data collected by other organizations; to supply these to GRID users; and to help nations and institutions to acquire GIS and related image-analysis technology so that GRID can develop into a global environmental information exchange network.



GRID operates through seven regional centres. Each serves as a kind of environmental switchboard to provide data to users in its region. It also provides formal training in cooperation with the UN Institute for Training and Research (UNITAR).

GRID has helped to set up an environmental database for Uganda, which has assisted development planning; to estimate the number of elephants left in Africa; to pinpoint suitable sites for the development of aquaculture in Costa Rica; and to evaluate new methods of using satellite data to map and monitor the tropical forests.

IRPTC *International Register of Potentially Toxic Chemicals*



We cannot use and dispose of specific chemicals safely unless we know what risks they pose. In 1976, UNEP established IRPTC to collect and disseminate this vital information.

IRPTC operates through a network of national and international organizations, industries and external contractors. National correspondents in 113 countries feed information into IRPTC and relay it back to interested parties at home.

IRPTC's computerized central data files contain profiles of over 800 chemicals. In addition, there are special files on waste management and disposal, on chemicals currently being tested for toxic effects and on national regulations covering around 9,000 substances. The legal and waste management files, as well as the data files, can all be accessed via computers through telephone lines, and IRPTC is working on making them available to the users of personal computers.

IRPTC plays an important part in the battle to ensure that substances banned or severely restricted in developed countries are not dumped on developing countries. In 1989, UNEP's Governing Council adopted the amended London Guidelines for the Exchange of Information on Chemicals in International Trade, which included a procedure for prior informed consent (PIC). In the same year FAO incorporated PIC in its international pesticides code. A joint programme has been established to implement PIC.

By 1992, 110 countries had nominated 149 national authorities to act as channels for PIC. As a start, the procedure will be applied to chemicals banned or severely restricted in 10 or more countries. Some acutely hazardous pesticides, whose use is causing problems in developing countries, will also be included, even though no country has taken severe action against them. Eventually PIC will be applied to all chemicals banned or severely restricted in any country.

Under the procedure, countries are given a *Decision Guidance Document*, designed to help them assess the risks associated with the chemical concerned. They can then make an informed decision on whether to allow it to be imported in the future. It is up to participating countries to enforce these decisions. Details of these exchanges are entered into a joint FAO/UNEP PIC database. The procedure was launched in late 1991, when *Decision Guidance Documents* for the first six pesticides were sent out.

With UNITAR, IRPTC provides training programmes to assist developing countries in implementing the London Guidelines and PIC, and also in setting up national registers of potentially toxic chemicals.

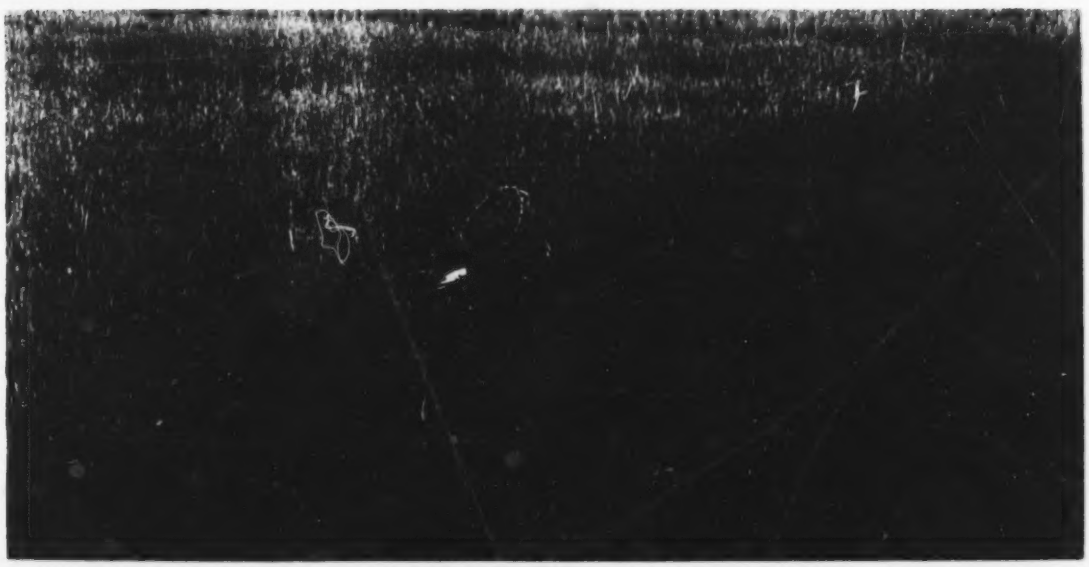
INFOTERRA

In 1972, the Stockholm Conference called for an international mechanism for the exchange of environmental information. UNEP responded with the International Referral System (IRS), later called INFOTERRA.

INFOTERRA operates through a network of institutions, designated by governments to act as national focal points for the scheme. Each national focal point (NFP) prepares a 'Who's Who' of environmental expertise in its country and selects the best sources for inclusion in INFOTERRA's *International Directory*. Several countries also publish their own national directories. From these two lists, national focal points reply to requests for information.

INFOTERRA is now the largest environmental information system in the world that links national and international institutions and experts. Its network covers 149 countries and its *International Directory* includes 6,500 institutions. In addition NFPs have access to some 600 commercial databanks. INFOTERRA has also established a network of centres of excellence which are contracted to answer queries forwarded to them. They include UNEP's GEMS, GRID, IRPTC and Industry and Environment PACs.

Queries come in to INFOTERRA from all over the world and range over the whole spectrum of the environment. It deals with some 21,500 queries a year, by the simple expedient of knowing where to find the answers. INFOTERRA has proved a remarkably inexpensive way of supplying environmental information to users throughout the world.



Across-the-board activities

ENVIRONMENTAL LAW

Laws are a major tool of environmental management. Environmental law encompasses a wide spectrum – from 'hard law' with binding effects, such as international treaties and national legislation, to 'soft law', such as guiding principles, recommended practices and procedures, and standards. It covers both such specific problems as soil degradation, marine pollution or the depletion of non-renewable resources and also such functional tasks as environmental impact assessment. It complements a wide range of other activities.

At the national level, environmental legislation regulates the activities of enterprises and individuals and provides the framework within which environmental standards can be enforced. At the international level, conventions, protocols and agreements bring countries together at a bilateral, regional or global level to address common environmental concerns.

ACTION

Before 1972, there were 58 international treaties and other agreements concerning the environment. Between 1972 and 1992, 96 such agreements were adopted regionally or globally. UNEP played a catalytic and coordinating role in about one third of these.

The legal frameworks to manage regional seas (see p 21) were all prepared under the aegis of UNEP. So was the Agreement on the Action Plan for the Environmentally-Sound Management of the Common Zambezi River System, signed in 1987.

On a global level, UNEP administers the 1973 Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the 1979 Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS). More recently, UNEP has played a major role in the preparation of landmark agreements on the ozone layer, hazardous wastes, climate change and biological diversity – the Vienna Convention for the Protection of the Ozone Layer (1985), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987) and its amendments of 1990, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), the United Nations Framework Convention on Climate Change (1992) and the Convention on Biological Diversity (1992).

UNEP has also promoted the development of such guidelines and non-binding legal agreements as the World Charter for Nature, adopted by the UN General Assembly in 1982, the London Guidelines on Trade in Harmful Chemicals, adopted by UNEP's Governing Council in 1987 and amended in 1989, and the Cairo Guidelines and Principles on Hazardous Waste Management, also adopted by the Governing Council in 1987.

The Montevideo Programme for the Development and Periodic Review of Environmental Law was also prepared under the auspices of UNEP. Adopted by the Governing Council in 1982, it sets priorities for global law-making.

ENVIRONMENTAL EDUCATION AND TRAINING

The aim of environmental education and training is not only to develop awareness, but also to encourage problem-solving skills and sensitivity to the link between environment and development.

Education which draws on the latest findings of science and technology has played a leading role in creating a better understanding of environmental problems. Environmental studies is now regarded as a subject in itself in many schools and universities. Universities and research centres all over the world offer undergraduate and postgraduate degrees in environment or training programmes on specific environmental issues.

ACTION

UNEP has championed environmental education and training since its earliest days. In 1975, with UNESCO, it convened an international workshop in Belgrade to draw up a global framework for environmental education. That same year, UNESCO and UNEP launched the International Environmental Education Programme (IEEP), to promote environmental education for all age groups both within and outside the formal education system.

In 1977, the International Conference on Environmental Education, convened by UNESCO and UNEP in Tbilisi, developed guidelines and programmes urging schools and universities to promote environmental studies both as a subject in its own right and as a facet of other subjects. In 1987, after the Moscow Congress on Environmental Education and Training, UNEP and UNESCO jointly published the *International Strategy for Action in the Field of Environmental Education and Training for the 1990s*. It has been widely disseminated in nine languages and serves as a basis for national strategies.

Over 150 countries have been involved in the IEEP programme. Through it, UNEP and UNESCO have been able to train some 12,000 educators and trainers. The IEEP newsletter, *Connect*, appears in eight languages and reaches more than 20,000 educators and educational institutions each year.

PUBLIC AWARENESS

People are the most valuable resource in development. As such, they need to be aware of the effect of the environment on their well-being and of the impact of their lifestyles on the environment.

Awareness of the web which links human activities and the environment has grown steadily since the Stockholm Conference. Voluntary action groups at the community level, national and global non-governmental organizations (NGOs), scientific bodies, mass media and governments have all played their part. Increased public awareness and the activities of different NGOs have led to many advances over the last two decades.

If people are to play a constructive part in accelerating and sustaining development, they need environmental information in a language they can understand and in a form which they can relate to their own situation.

Every June 5 people all over the world celebrate World Environment Day, in support of UNEP's objectives. On the same day, the Secretary-General of the United Nations presents the Sasakawa Environment prize, honouring the year's most outstanding contribution in the field of the environment. And UNEP marks the occasion by naming individuals and organizations to its Global 500 roll of honour, instituted in 1987. Nominees – ranging from rural workers to politicians – are chosen for their achievements on the frontlines of global environmental action.

UNEP attaches great importance to its links with NGOs and community groups. The Outreach network, for example, is a unique coalition of organizations which disseminates information on environmental and health issues. Its policy is to open up dialogue with people who are receptive to the environmental message, such as relief workers, women, youth, religious groups, industry and parliamentarians. UNEP's goodwill ambassadors also help to spread its message worldwide.

UNEP uses special information packages, features, news releases, exhibits, publications and regular contact with the media and governments to alert people to environmental issues and to stimulate community and non-governmental action.

It disseminates a broad range of environmental news and information, publishes a variety of material, produces TV spots and runs a film and video loan service. In 1984, UNEP and the British independent television company Central TV founded the Television Trust for the Environment, which has arranged over 60 international co-productions, reaching audiences in 90 countries.

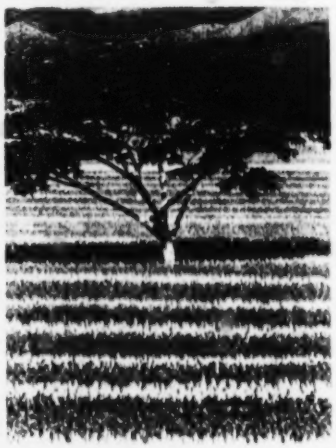
THE CLEARING-HOUSE

Many of the recommendations of the Stockholm Action Plan stressed the need to provide technical and financial assistance to developing countries in addressing their environmental problems. This necessity has only become clearer in the last two decades. Such help is of fundamental importance if these countries are to pursue sustainable paths of development.

UNEP's Clearing-house mechanism was established in 1982 to act as a bridge between developing countries and potential donors. It functions as an integrated part of UNEP's task of coordination and catalysis. Through it, UNEP assists developing countries in their efforts to deal with their environmental problems and helps them to find the financial and technical resources they need.

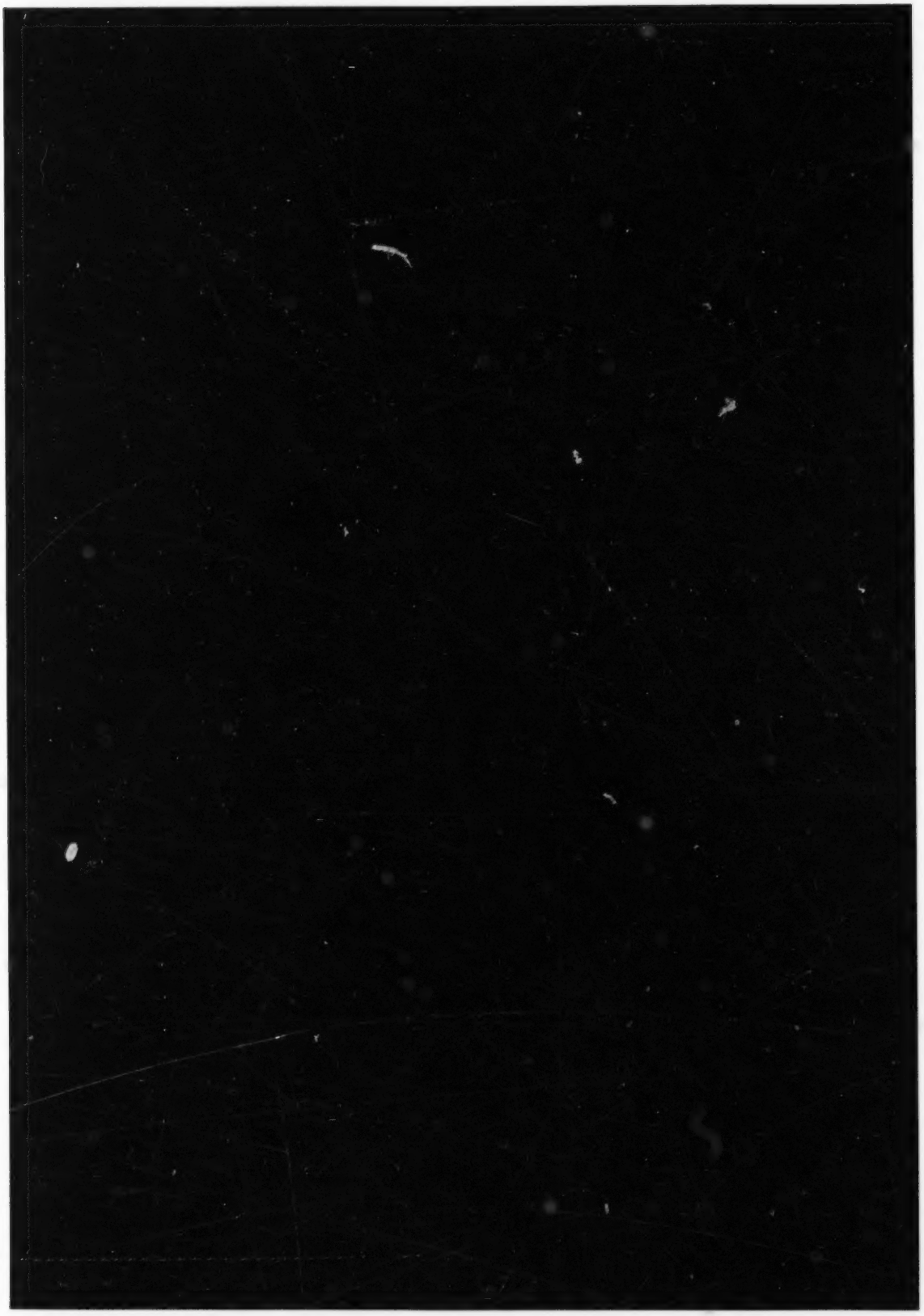
ACTION

Clearing-house helps these countries to formulate priority programmes and projects, and, in order to do so, mobilizes financial and other resources. In addition, it acts as a broker, matching up potential donors with identified projects and forging links between developing countries and donors.



The Clearing-house has provided assistance to some 45 countries, from small individual projects to complete national action plans.

These activities depend completely on voluntary contributions and support from the international community. Support has been provided by Canada, the European Community, Finland, France, Germany, the Netherlands, Norway, the United Kingdom and the USA among others. An important source of aid to developing countries has been the Arab Gulf Programme for United Nations Development Organizations (AGFUND).



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PRIORITIES FOR THE FUTURE

Global warming, ozone depletion, soil loss, falling forests, disappearing species, pollution, poverty – a chain of daunting challenges faces the world community.

Many factors complicate our response. Environmental pollution spills over national boundaries, and air, water, land, and the biosphere cannot be isolated from human activities. In spite of the progress of the last two decades, there are still serious gaps in our understanding of the intricate balances of the Earth's systems and of what happens to different pollutants in different circumstances.

In spite of its immense diversity, the planet is one global ecosystem. To protect it, good political intentions must be translated into practical collective actions.

To achieve sustainable societies, we must understand the forces which generate environmental problems and hinder social and economic development. The causes of the economic, political and environmental gulfs within and between countries are complex. We must make the right diagnosis and prescribe the cure for today's ailments and the prevention for tomorrow's.

The experience of the last two decades and of the United Nations Conference on Environment and Development in Rio de Janeiro in June 1992 have set UNEP's priorities for the next decade.

These priorities provide a practical base for direct action and for national and international policies. They aim to reconcile the social, economic and environmental goals of development and to address the underlying causes of environmental degradation and human suffering: unmanageable population growth, grinding poverty, crushing debt and unfair international economic relations on the one hand and unsustainable lifestyles, unbridled consumption and irresponsible use of resources on the other.

Priorities for the next decade

ENVIRONMENTAL MANAGEMENT

☐ Approve two concrete five-year programmes to combat land degradation in drylands (desertification).

☐ Establish a UN Centre for Response to Environmental Emergencies.

☐ Achieve a 30 per cent reduction in the amount of hazardous waste generated, compared with the 1990 level.

☐ Adoption by major development financing institutions of policies and procedures that ensure that their financial support to development activities does not lead to environmental deterioration.

☐ All countries to adopt environmental and natural resource accounting as part of their system of national accounts.

☐ Capital flows in the form of natural resource imports and exports to be included in international trade statistics.

☐ All countries with real GDP per capita above US$5,000 to produce a plan to reduce their consumption of non-renewable natural resources.

☐ All countries with per capita annual energy consumption over 80 gigajoules to stabilize consumption at 1992 rates and establish programmes to reduce energy use to the 80 gigajoule level.

☐ End net global deforestation.

☐ Estimate the global costs of failing to deal with climate change, ozone-layer depletion, loss of biodiversity, marine and coastal deterioration from land-based sources of pollution, and continued production of hazardous wastes.

☐ Estimate additional resources needed to promote transfer of knowledge and specific technologies to developing countries and countries in transition, to allow them to participate meaningfully in dealing with their national as well as global environmental problems.

ENVIRONMENTAL ASSESSMENT

☐ Assessment of the environmental impacts of known new and alternative sources of energy.

☐ Comprehensive assessment of air quality in all urban areas.

☐ Comprehensive assessment of global freshwater resources and their quality.

☐ Comprehensive assessment of land and soil degradation in the world.

☐ Environmental impact assessment of existing new technologies.

☐ Environmental impact assessment of existing new materials.

☐ Survey of world's habitats known to be unique, rich in biodiversity, or at risk.

SUPPORT MEASURES

☐ A global agreement on reforestation targets for each decade of the 21st century in each of the world's eco-regions.

☐ A global plan to combat marine pollution from land-based sources, with a target to reduce, by the year 2000, marine pollution from such sources to the 1990 level, and an agreed programme for further reductions after 2000.

☐ International agreement to ban all exports of hazardous wastes to developing countries, and a timetable to reduce the generation of such wastes.

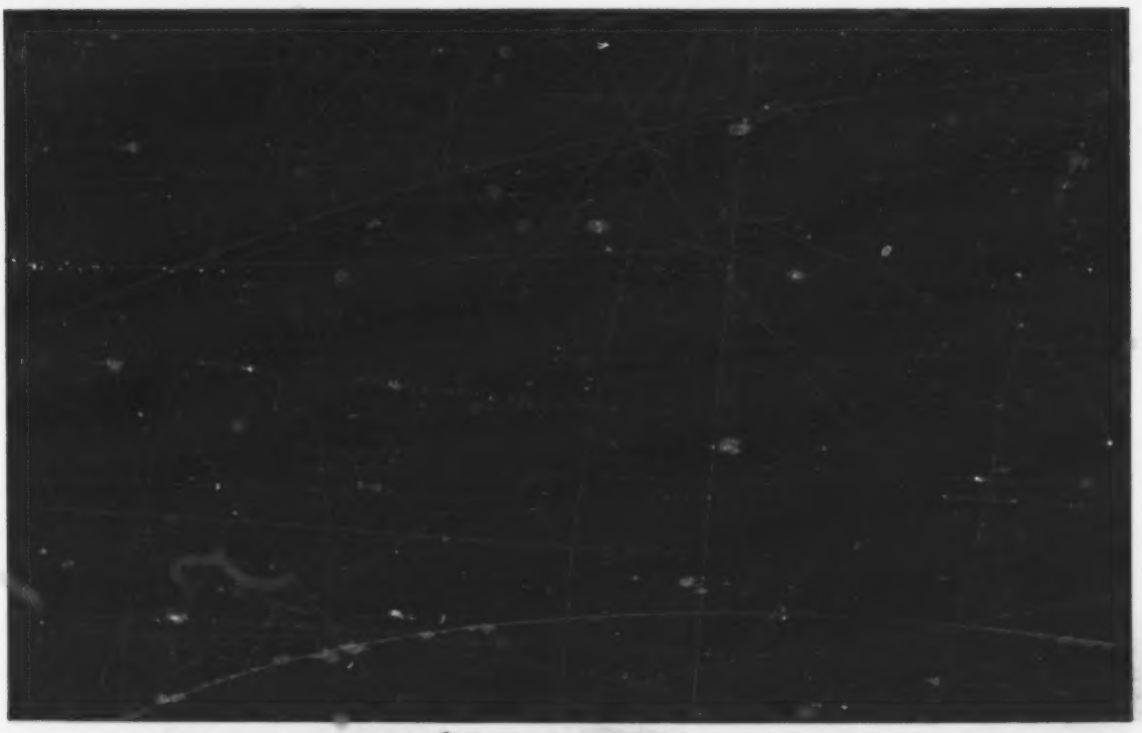
☐ A global convention for the exchange of information on chemicals in international trade and establishment of an intergovernmental mechanism for chemical risk assessment and management.

☐ A global convention on prevention, notification and mutual cooperation in mitigating the effects of major environmental emergencies.

☐ An international code of conduct to apply internationally agreed guidelines for the transfer of technology, particularly to developing countries.

☐ An international agreement on the guidelines for application of environmental impact assessment, especially with regard to human activities with potential transboundary effects.

☐ Agreement on the means of ensuring compliance with environmental treaties and establishment of appropriate institutional mechanisms to verify their implementation and to check their effectiveness in dealing with the problems which they were designed to address.



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Published by Information and Public Affairs Branch, UNEP
PO Box 30552, Nairobi, Kenya

ISBN 92-807-1359-0

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The views expressed are those of the author and do not necessarily reflect the official views of the United Nations Environment Programme.

A Banson Production, 3 Turville Street, London E2 7HR

Designed by Roger Whisker Printed by KPC on paper made from sugar cane waste.

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